



International Association for Pattern Recognition, Inc.

An affiliate member of the International Federation for Information Processing

# NEWSLETTER

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## FROM THE EDITORS DESK

Dear Colleagues,

The lead item in this issue is the forthcoming IAPR sponsored International Conference on Pattern Recognition which will be held in Paris from October 27 to October 31. In addition to the extensive collection of papers, the first day will be devoted to a set of four concurrent tutorials. Also, on the last day, an IAPR sponsored workshop on Expert Systems and Pattern Analysis will be held. This year the conference, which is the main sponsored event of the IAPR, is being organized by AFCET. The calls for papers section in this

issue also contains several other IAPR sponsored activities.

A number of changes have been made to the IAPR directory and it is included in this issue in its entirety. Recent additions to the IAPR membership include three individual members. In addition to the 21 national member organizations there are now 5 individual members. Continuing individual members are from Australia and Brazil, and the new members are from Romania, Bulgaria and Taiwan, China.

In all countries with a national member organization, except for the United States, this newsletter is sent to all members of that organization. In the United States the newsletter is distributed to members of the IEEE Technical Committee on PAMI. I have found that many of my colleagues are not aware of either the IAPR newsletter or this technical committee so I have included a note on how to apply for membership. Note that membership must be applied for; it is not automatic even if you are a member of the IEEE Computer Society or if you subscribe to the IEEE Transactions on PAMI. You may wish to pass this information on to your colleagues in the United States since I suspect that there may be a large number of people who would like to receive this newsletter if they were aware of it.

This is the last issue of the newsletter which I will be editing. I wish to express my sincere thanks to Russ

Taylor who has played a major role in the production of the issues which I have edited. The new newsletter editor will be Dr. Josef Kittler. His mailing address is given in the directory.

Anthony P. Reeves

### TO RECEIVE IAPR NEWSLETTER IN THE UNITED STATES

In the United States, the IEEE Computer Society Technical Committee on Pattern Analysis and Machine Intelligence circulates the IAPR newsletter to its members as a courtesy. Currently, *neither* membership in the IEEE Computer Society, nor, as we understand it, in the IEEE, is required to become a corresponding member of the Technical Committee on PAMI, for which the member will receive, amongst other things, the IAPR newsletter. To become a member of the Technical Committee on PAMI, write to the address below, requesting the general *Technical Committee Application* form.

IEEE Computer Society  
1730 Massachusetts Ave. NW  
Washington, DC 20036-1903

## EIGHTH INTERNATIONAL CONFERENCE ON PATTERN RECOGNITION

### CONFERENCE CHAIRMAN'S MESSAGE

The 8th ICPR is one of the major scientific and social event of this fall in Paris. This conference emphasizes the importance of research and application in the field of Pattern Recognition, one of the most active and interesting domain of Computer Science. According to the interest shown in more than thirty countries, we hope to overcome the number of 1.000 participants. This requires a very large effort of all, authors, speakers, reviewers, organizing committee, AFCET secretariat. I wish to thank them warmly for their dedication to this collective effort. I wish also to welcome all the potential participants, who should find what they are expecting from an International Conference of high standing: tutorials, invited conferences, communications, panels, an exhibition, and opportunities to meet the best specialists of the field.

Jean Claude SIMON

## TUTORIALS

### TUTORIAL ON TEXT RECOGNITION

Date: Monday, 27 October 1986

This tutorial will examine optical character recognition (OCR) in the light of hardware and algorithmic advances that exist today. Specifically, the tutorial will address the question of whether the new machines can rival humans. The nature of the new ideas and processes for OCR, and the industrial realizations will be considered.

#### Lecturers:

*Dr. Wolfgang Doster*  
*Dr. Theo Pavlidis*  
*Pr. J.-C. Simon*  
*Pr. Ching Y. Suen*

### TUTORIAL ON STATISTICAL PATTERN RECOGNITION

Date: Monday, 27 October 1986

This tutorial will introduce the methodology of statistical pattern recognition. Various design considerations including one-shot vs. Tree classifiers, parametric vs. nonparametric approaches, feature selection, and error estimation will be discussed. Some commercial recognition systems will be considered.

#### Lecturers:

*Dr. R. S. Anbalagan*  
*Dr. P. A. DeviJer*  
*Pr. J. Kittler*  
*Pr. A. K. Jain*

### TUTORIAL ON SPEECH RECOGNITION

Date: Monday, 27 October 1986

This tutorial will review the basic concepts and principles of automatic speech recognition, as well as the major trends in advanced research in this field.

#### Lecturers:

*Pr. R. De Mori*  
*Pr. J. P. Haton*  
*Dr. H. Ney*  
*Pr. G. Perennou*

### TUTORIAL ON ARTIFICIAL INTELLIGENCE

Date: Monday, 27 October 1986

This tutorial is intended for scientists, engineers, mathematicians, and those involved in information pro-

**TUTORIALS AT A GLANCE**  
**Monday, October 27, 1986 - Palais des Congrès, PARIS**

ROOM	63 b	61	63 a	65
09:00 - 09:45	TEXT RECOGNITION	STATISTICAL PATTERN RECOGNITION	SPEECH RECOGNITION	ARTIFICIAL INTELLIGENCE
BREAKS : 15 min in the morning and in the afternoon LUNCH : 1 hour and 15 min.				

**CONFERENCE AT A GLANCE**

Tuesday, October 28, 1986

09:15 - 11:00	<b>Salle Bleue - Blue Room</b>			
OPENING SESSION				
11:00 - 11:10	COFFEE BREAK			
ROOM	51	53	54	55
11:10 - 12:50	(1.1) VISUAL INSPECTION	(1.12) SPECIALIZED ARCHITECTURES (1)	(1.13) SPEECH RECOGNITION (1)	(1.14) DATA CLASSIFICATION AND CLUSTERING (1)
12:50 - 14:30	LUNCH BREAK			
14:30 - 16:10	(1.2) IMAGE UNDERSTANDING	(1.22) 3-D VISION (1)	(1.23) INFERENCE AND LEARNING	(1.24) PATTERN RECOGNITION ALGORITHMS (1)
16:10 - 16:40	COFFEE BREAK			
16:40 - 18:20	(1.3) MOBILE ROBOT	(1.32) KNOWLEDGE BASED RECOGNITION (1)	(1.33) RELAXATION	(1.34) SIGNAL PROCESSING

Wednesday, October 29, 1986

ROOM	51	53	54	55
09:00 - 10:40	(2.1) 3-D VISION (2)	(2.12) KNOWLEDGE BASED PATTERN RECOGNITION (2)	(2.13) IMAGE SEGMENTATION	(2.14) FUNDAMENTAL ASPECTS OF PATTERN RECOGNITION (1)
10:40 - 11:10	COFFEE BREAK			
11:10 - 12:50	(2.2) LOW LEVEL IMAGE PROCESSING	(2.22) MOTION (1)	(2.23) QUADRRES	(2.24) FEATURE SELECTION AND PATTERN ANALYSIS
12:50 - 14:30	LUNCH BREAK			
14:30 - 16:10	(2.3) OPTICAL CHARACTER RECOGNITION	(2.32) EDGE DETECTION (1)	(2.33) PATTERN RECOGNITION ALGORITHMS (2)	(2.34) TEXTURE
16:10 - 16:40	COFFEE BREAK			
16:40 - 18:20	(2.4) SHAPE	(2.42) OFFICE AUTOMATION	(2.43) SPEECH RECOGNITION (2)	(2.44) BIOMEDICAL APPLICATIONS

Thursday, October 30, 1986

ROOM	51	53	54	55
09:00 - 10:40	(3.1) OBJECT RECOGNITION AND RECOGNITION	(3.12) STEREOVISION (1)	(3.13) PATTERN RECOGNITION ALGORITHMS (3)	(3.14) APPLICATIONS
10:40 - 11:10	COFFEE BREAK			
11:10 - 12:50	(3.2) HANDWRITTEN CHARACTER RECOGNITION	(3.22) IMAGE AND VISION	(3.23) EDGE DETECTION (2)	(3.24) DATA CLASSIFICATION AND CLUSTERING (2)
12:50 - 14:30	LUNCH BREAK			
14:30 - 18:20	POSTER SESSION			

Friday, October 31, 1986

ROOM	51	53	54	55
09:00 - 10:40	(4.1) IMAGE CODING	(4.12) STEREOVISION (2)	(4.13) CHARACTER RECOGNITION	(4.14) OBJECT AND IMAGE ANALYSIS
10:40 - 11:10	COFFEE BREAK			
11:10 - 12:50	(4.2) MOTION (2)	(4.22) IMAGE ANALYSIS (1)	(4.23) FUNDAMENTAL ASPECTS OF PATTERN RECOGNITION (2)	(4.24) SPEECH RECOGNITION (3)
12:50 - 14:30	LUNCH BREAK			
14:30 - 16:10	(4.3) 3-D VISION (3)	(4.32) IMAGE SEQUENCES AND TRACKING	(4.33) IMAGE ANALYSIS (2)	(4.34) CHARACTER AND TEXT PROCESSING
16:10 - 16:40	COFFEE BREAK			
16:40 - 18:20	(4.4) REMOTE SENSING	(4.42) SPECIALIZED ARCHITECTURES (2)	(4.43) COMPUTATIONAL GEOMETRY	(4.44) PYRAMIDS

cessing. It surveys artificial intelligence by presenting key concepts and techniques.

**Lecturers:**

*Pr. S. L. Tanimoto*  
*Pr. N. Cot*

## IAPR SATELLITE MEETING

### WORKSHOP EXPERT SYSTEMS AND PATTERN ANALYSIS

Date: 31 October 1986

Place: Palais des Congres de Paris

Participants who wish to attend this workshop are requested to contact:

Professor C. H. Chen  
Electrical and Computer Engineering Dept.  
of Southeastern Massachusetts University  
N. Dartmouth, MA 02747, USA

### GENERAL INFORMATION

#### Hotel Reservations

Reservations for accomodations in Paris can be made through:

WAGONS-LITS Tourisme  
10, rue Auber  
75009 - PARIS France

#### Registration

The registration forms must be accompanied by payment or purchase order. The cost of registration in all categories rises 300 FF after October 6, 1986.

Participants are requested to register at the conference as soon as possible after arrival. The Registration Center will be open from 03:00 p.m. to 05:00 p.m. on October 26, 08:30 a.m. to 05:45 p.m. on October 27, and 08:00 a.m. to 09:15 a.m. on October 28.

#### Secretariat

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**Cat B**  
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- Prof. J. Sklansky  
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- Prof. M.S. Watanabe  
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## REPORTS FROM JAPAN

This section contains report titles which have been submitted by corresponding editor Professor M. Nagao. Most of these reports are in Japanese. For further information regarding access to these reports please contact Professor Nagao directly, his mailing address is as follows:

Prof. M. Nagao  
Faculty of Engineering, Kyoto University,  
Sakyo-ku, Kyoto 606, Japan

- Positions and Attitudes Measurement of Polyhedrons from a Binary Image
- A Method of Description of Human Motions by chemicals and Its Application
- A 3D Vision System: Generating and Matching Shape Descriptions in Range Images  
*Fumiaki Tomita*, Electrotechnical Laboratory; *Takeo Kanade*, Carnegie-Mellon University.
- Analysis of Optical Flow under Orthographic Projection *Ken-ichi Kanatani*, Department of Computer Science, Gunma University
- Dynamic Scene Analysis for a Mobile Robot in a Man-Made Environment *Yasushi Yagi*, *Minoru Asada*, *Masahiro Yachida*, *Saburo Tsuji*, Department of Control Engineering, Osaka University.
- A Report of IEEE Computer Society Workshop on Visual Languages  
IEEE Computer Society Workshop on Visual Languages.
- Revision of the Standard Format for Digital Images  
Technical Committee on Computer Vision.
- Analysis of Optical Flow under Central Projection *Ken-ichi Kanatani*, Department of Computer Science, Gunma University.
- Extraction of visible patterns of 3D objects *Tomomitsu Murano*, *Tozen Hai*, *Eiichiro Yamamoto*, Fujitsu Laboratories Ltd.
- An Expert System for Top-Down Image Segmentation *Takashi Matsuyama*, *Masaharu Ozaki*, Department of Electrical Engineering, Kyoto University.
- Feature extraction and hierarchical decomposition for a closed curve using averaging operations *Takashi Matsuyama*, *Hiroshi Yonezawa*, *Keizo Azuma*, Kyoto University.
- Methods for Measuring Surface Structures Using Projected Regular Patterns and an Advancing Camera *Kaihua Feng*, *Kokichi Sugihara*, and *Noboru Sugie*, Faculty of Engineering, Nagoya University.
- On Discrimination between Cylindrical Objects and Conical Ones in a Perspective Image *Qiu Zhong Qi*, *Tadahiro Kitahashi*, Toyohashi University of Technology.
- IDATEN: A Real-Time Image Processing System with Modifiable Network *Shigeru Sasaki*, *Tatsuya Sato*, *Hiromichi Iwase*, *Toshiyuki Goto*, Fujitsu Laboratory Ltd.
- Fundamental Study of Input Method of 3D Digital Image *Yoshiaki Usami*, *Misato Nio*, Hitachi Research Laboratory, Hitachi Ltd.
- Three Methods for synthesizing automatically the bodies from the maps of three directional projections
- An automatic identification and tracking of a preceding car *Masayuki Nakajima*, *Takeshi Agui*, *Mitsuo Harumatsu*, Imaging Science and Engineering Laboratory, Tokyo Institute of Technology.
- Associative reconstruction of two dimensional figures - application to archaeology materials
- Automatic Digitizing Method of Dotted and Broken Lines in Drawings  
*Yutaka Ohsawa*, *Kazutosi Usui*, and *Masao Sakauchi*, University of Tokyo
- Stereo Matching Based on Region Boundary Segments  
*Fumiaki Tomita*, Electrotechnical Laboratory.
- Depth Determination and Reduction of Occluded Area by Tri-ocular Stereo *Masaki Watanabe*, *Uichi Ohta*, *Katsuo Ikeda*; University of Tsukuba, Sakura, Ibaraki, 305 Japan.



- **The Image Database System for Computer Graphics** *Yasuharu Shimaki*, Matsushita Elec. Ind. Co.; *Toshiyuki Kawai*, Osaka University; *Masaki Nasu*, Osaka University, NEC Co.; *Toru Kawata*, Osaka University, Sharp Co.; *Isao Shirakawa*, Osaka University; *Koichi Omura*, Osaka University.
- **A Polygonal Approximation Method for Freehand Line Drawings** *Akira Inoue*, *Katsuhiko Nishikawa*, *Kiyoshi Iwata*, Fujitsu Laboratories, Ltd.
- **Segmentation and Motion Estimation of Multiple Moving Objects** *Yamamoto Masanobu*, Electrotechnical Laboratory.
- **A vision system for bin-picking tasks guided by an interpretation tree from a CAD model** *Katsushi Ikeuchi*, Electro-Technical Laboratory.
- **A Mathematical Theory of Recognizing Patterns (Part IV. A Primitive Domain of Patterns)** *Shoichi Suzuki*, Department of Management Information, School of Information, Bunkyo University.
- **Discrimination of Similar Characters by K-L Expansion and Quantification Theory (Type-III)** *Daisuke Nishiwaki*, NIHON University, Graduate School & College of Sci. & Tech.; *Sugio Satoh*, NIHON University, Graduate School & College of Sci. & Tech.; *Akiyoshi Itoh*, NIHON University, Department of Electronic Engineering; *Kenji Kawanishi*, NIHON University, Department of Electronic Engineering.
- **Recognition Algorithm for Low Quality Stamped Alphanumerals** *Tomoaki Nakano*, *Osamu Ozeki*, *Shin Yamamoto*, Toyota Central Research and Development Laboratories, Inc.
- **Fractal Dimension as an Image Feature** *Hiroshi Kaneko*, Masashino Electrical Communication Laboratory, N.T.T.
- **3-D Space Analysis by Perspective Moving Frame** *Takeshi Shakunaga*, *Hiroshi Kaneko*, Musashino Electrical Communication Laboratory, N.T.T.
- **A Method for Recognizing 3-Dimensional Position of a Rigid Body Using The Data Concerned with its Figure** *T. Hayashi*, Department of 1st Prosthetic Dentistry, School of Dentistry, Niigata University; *T. Iijima*, Department of Computer Science, Faculty of Engineering, Tokyo Institute of Tech.
- **Algorithm for Seeking Optimal Candidate Sequence Based on the Relational Model among Vowels** *Rong Yu* and *Masayuki Kimura*, Faculty of Engineering, Tohoku University.
- **Loaded Printed Circuit Board Inspection with 3-D Measurement of Component Orientation** *Yoshikazu Kakinoki*, *Moritoshi Ando*, *Takefumi Inagaki*, Fujitsu Laboratories Ltd. Atsugi.
- **Automatic Production Method of A Dictionary for the Pattern Recognition** *Yuzo Kato*, Central Res. Lab. Canon Inc.
- **Dimensional Reduction of Direction Contributivity Feature Vector for Recognition of Handprinted Kanji Characters** *Norihiro Hagita*, *Isao Masuda*, NTT Research Laboratories.
- **Automatic Off-Line Verification of Signatures Based on Pressure Features** *Maan Ammar*, *Yuuji Yoshida*, and *Teruo Fukumura*, Faculty of Engineering, Nagoya University.
- **Automated Construction of Image Processing Procedures by Sample-Figure-Presentation and its Application to Construction of Border Extraction Procedures** *Jun-ichi Hasegawa*, *Hiroaki Kubota*, *Jun-ichiro Toriwaki*, Dept. of Information Engineering, Faculty of Engineering, Nagoya University.
- **Can We Solve The Continuous Karhunen-Loeve Eigenproblem From The Discrete Data?** *Hidemitsu Ogawa*, Tokyo Institute of Technology, Department of Computer Science, Ookayama, Meguro-ku, Tokyo 152, Japan; *Erkki Oja*, University of Kuopio, Department of Applied Mathematics, SF-70211, Kuopio 21, Finland.
- **Binary-Picture Complexity and Image Thresholding** *Rin-ichiro Taniguchi* and *Eiji Kawaguchi*, Graduate School of Engineering Sciences, Kyushu University.
- **A Document Image Segmentation Method Based on Projection Profiles and Stroke Densities** *Teruo Akiyama*, *Isao Masuda*, NTT Electrical Communications Laboratories.
- **Structure Analysis of Kanji Characters by Means of Stroke Representative Points** *Yasuo Ishii*, Information Processing Network Center, Fujitsu Laboratories.
- **An Extended Prolog System for Picture Recognition** *Tsutomu Endo*, Faculty of Engineering, Oita University.
- **Automatic Extraction of Contour Lines in a Topographical Map and its Application** *Hiroaki Seto*, *Masatoshi Mori*, *Akira Nakamura*, Nagasaki University.
- **3-D Configuration Recovery of 3 Line Segments on the Image by Perspective Angle Transform** *Takeshi Shakunaga*, *Hiroshi Kaneko*, Electrical Communication Laboratories, NTT.
- **Utilization of a Stripe Pattern for Dynamic Scene Analysis** *Minoru Asada* and *Saburo Tsuji*, Osaka University.
- **Local Spatial Fourier Analyses of Images using "Tomographic Representation"** *K. Okajima*, *S. Fujiwara*, NEC Corp. Fundamental Research Labs.
- **A Real Time Transformation Method of Drawing Images Using Dataflow Processors** *Hui Shieh*, *Yasuo Aiki*, *Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **SIPS: A Multiprocessor System for Video Image Processing** *Atsushi Hasebe*, *Ryohei Kato*, *Norikazu Ito*, *Atsushi Kikuchi*, SONY Corporation Information Systems Research Center.
- **A Branching Algorithm for Checking Equivalence of Finite-Turn DPDA's** *Masahiro Igarashi*, *Etuji Tomita*, *Takashi Suzuki*, *Hisayoshi Nishida*, The University of Electro-Communications, NEC Corp.
- **Area-Period Optimal VLSI Circuits for Polynomial Multiplication and Division** *Koichi Wada*, *Masanobu Mizuno*, *Kimio Kawaguchi*, Department of Electrical and Computer Engineering, Nagoya Institute of Tech.
- **On Special-Purpose Hardware for High-Speed Text Retrieval** *Shin-ichi Wakabayashi*, Science Institute, IBM Japan, Ltd.
- **On Unification Hardware Using UNION-FIND Memory** *Masaaki Ohkubo*, *Hiroto Yasuura*, *Naofumi Takagi*, and *Shuzo Yajima*, Faculty of Engineering, Kyoto University.
- **Synthesis Methods of Systolic Algorithm** *Daisuke Miura*, *Hiroto Aso*, *Yasuyosi Inagaki*, Faculty of Engineering, Nagoya University.
- **Design of an nMOS Image Processor Based on Quaternary Logic** *Takahiro Hanyu*, *Michitaka Kameyama*, *Tatsuo Higuchi*, Faculty of Engineering, Tohoku University.
- **Architecture of A List-Processing Oriented Dataflow Machine** *Hirohide Mikami*, *Masaru Takesue*, *Ryuzou Hasegawa*, *Makoto Amamiya*, NTT Electrical Communications Laboratories.
- **On the Pipelined Image Processing Algorithms and Their Applications** *Akira Nakayama*, *Yuuji Yoshida*, *Teruo Fukumura*, Department of Information Engineering, Faculty of Engineering, Nagoya University.

- **An Architecture of a Graphics Processor: SIGHT** *Tokichihiro Takahashi, Tadashi Naruse, Masaharu Yoshida, and Seeichiro Naito*, Electrical Communication Laboratories, NTT.
- **System Architecture for Automatic Drawings Reader** *Shigeyoshi Shimotsuji, Akio Okazaki, and Shou Tsunekawa*, Research and Development Center, Toshiba Corporation.
- **Fingerprint Identification for Personal Verification** *Koichiro Morita, Ko Asai*, NEC Corporation C&C Systems Research Laboratories.
- **Extraction of Line Figures in a Binary Image and Its Applications** *Tadao Wakayama*, NTT Electrical Communications Laboratories.
- **Recognition method using tree representation for handwritten script English small letters** *Tadashi Suzuki, Kyota Aoki*, Faculty of Engineering, Utsunomiya University.
- **A New Representation Method of Color pictures for Color Reproduction** *Keiji Yamada, Michihiko Minoh, Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **Extraction and Binarization of the images of Line drawings using Local gray-level patterns** *Hiroshi Okazaki, Michihiko Minoh, Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **A Vision System for Bin Picking Problems using Two Dimensional Models** *Noriko Nagata, Hiroyasu Taniguchi, Youji Fukada, and Takahiro Inari*, Mitsubishi Electric Corp.
- **Ray-tracing type Stereo Matching Method Using a Three-view Stereo** *Kouchi Arimura, Hiroshi Kaneko, Isao Masuda*, NTT Electrical Communication Laboratories.
- **Stereo Vision of a Mobile Robot: World Constraints for Matching** *Jiang Yu Zheng, Minoru Asada, and Saburo Tsuji*, Department of Control Engineering, Osaka University.
- **On the rough classification of handwritten characters based on partial and unified informations** *Toshiaki Ejima and Masayuki Kimura*, Faculty of Engineering, Tohoku University.
- **Online Deformation Prediction Matching Using Deformation Vector Field** *Toru Wakahara, Kazumi Odaka*, NTT Electrical Communications Laboratories.
- **A Method of Stroke Extraction for Hand-written Character - Design of Rule-based Knowledge Base** *Junzo Suzuki, Yoshihiro Kitamura, Yoshikazu Tezuka*, Faculty of Engineering, Osaka University.
- **A Study of Computer Assisted Design System for Brush-written Chinese Characters** *Koji Kitagawa, Takeshi Inoue, Hidehiko Sanada, Yoshikazu Tezuka*, Faculty of Engineering, Osaka University.
- **A Study on Recognition System of Visiting Card Image** *Yoshinori Sakurai, Koichi Kise, Koichi Murase, Naoki Tanaka, Hidehiko Sanada, Yoshikazu Tezuka*, Faculty of Engineering, Osaka University.
- **A Proposal of Character Segmentation from Handwritten Document Image with Aid of Knowledge** *Noboru Babaguchi, Masatoshi Tsukamoto, Tsunehiro Aibara*, Faculty of Engineering, Ehime University.
- **Accumulation, Retrieval and Transformation of Name List Image** *Hui Shieh, Yasuo Ariki, Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **Polyhedron classification by using vector field** *Toshihiko Mimura, Yoichiro Watanabe, Shozo Hoga*, Faculty of Engineering, Doshisha University.
- **Recognition of Vowels and Plosives Using One Pair Comparison** *Shigeyoshi Kitazawa*, Faculty of Engineering, Shizuoka University; *Masa-aki Ishikawa*, Faculty of Engineering, Kyoto University; *Hiro-aki Kojima*, Faculty of Engineering, Kyoto University; *Shuji Doshita*, Faculty of Engineering, Kyoto University.
- **Effect of Branch & Bound Search and Selection of Candidates Using Bottom-Up Phoneme Recognition** *Sho-ichi Matsunaga, Masaki Konda*, NTT Electrical Communications Laboratories.
- **A Consideration of Surmounting Individuality for Speaker-Independent Speech Recognition** *Shunichi Ishige, Kazunori Mano, Katsuhiko Shirai*, Dept. of Elec. Engr., Waseda University.
- **A Series of Digital Filter Windows Constructed of B-Splines** *Kazuo Toraiichi*, Institute of Information Sciences and Electronics, University of Tsukuba; *Masaru Kamada*, Doctoral Program in Engineering, University of Tsukuba; *Ryoichi Mori*, Institute of Information Sciences and Electronics, University of Tsukuba; *Claudio Morioka*, Foreign Student in Information Sciences and Electronics, University of Tsukuba.
- **A Spline Function Generator** *Kazuo Toraiichi*, Institute of Information Sciences and Electronics, Univ. of Tsukuba; *Masaru Kamada*, Doctoral Program in Engineering, Univ. of Tsukuba; *Qi Wang*, Institute of Information Sciences and Electronics, Univ. of Tsukuba; *Ryoichi Mori*, Institute of Information Sciences and Electronics, Univ. of Tsukuba.
- **A model estimation of gray-level image using pulse density modulation** *Junji Kawasaki*, Kanazawa Institute of Technology; *Taizo Iijima*, Tokyo Institute of Technology.
- **A Method for Recognizing 3-Dimensional Position of a Rigid Body Using Its Shape: Part 2. Error Analysis and Optimizaition of the Observation System** *Toyohiko Hayashi*, Department of 1st Prosthetic Dentistry, School of Dentistry, Niigata Univ.; *Taizo Iijima*, Department of Computer Science, Faculty of Engr., Tokyo Institute of Technology.
- **A Study of Character Extraction Method from Scene Images** *Jun Ohya, Akio Shio*, NTT Electrical Communications Laboratories.
- **A Fundamental Study on Capacity of Templet Matching Method for Handprinted KANJI Recognition - Multidictionary Templet Matching Method using A Super-computer** *Mitsuru Shiono*, Okayama University of Science.
- **A Measuring Method for the Deviations in Stroke Location and Stroke Direction in Handprinted Chinese Characters** *Norihiro Hagita and Isao Masuda*, NTT Electrical Communications Laboratories.
- **The Three Types of Relationships Among Japanese Vowels and Their Invaliability** *Rong Yu and Masayuki Kimura*, Faculty of Engineering, Tohoku University.
- **Improvement of Online Recognition of Piecewised-Linear-Approximated Cursive Writings** *Yasuhiro Kawai, Yukio Sato*, Department of Electrical and Computer Engineering, Nagoya Institute of Technology.
- **Handprinted Character Recognition fitted to the writer (III)** *Hiroyuki Morita, Shinji Tsuruoka, Fumitaka Kimura, Yasuji Miyake*, Faculty of Engineering, Mie University.
- **Preclassification of Handwritten Chinese Characters by Clustering Technique** *Akira Nishi, Shinji Tsuruoka, Fumitaka Kimura, Yasuji Miyake*, Faculty of Engineering, Mie University.
- **High-Speed Display Algorithm for Displaying a Road Map** *Angelica Yamaji, Fumitaka Kimura, Shinji Tsuruoka, Yasuji Miyake*, Faculty of Engineering, Mie University.

- **Integrated System of Weather Map Database and Contour Map Database** *Toshio Nakabayashi, Yuuji Yoshida, Teruo Fukumura*, Faculty of Engineering, Nagoya University.
- **Graphic Symbol Recognition of Logical Diagrams by Using Positive and Negative Symbol Set** *Nobuaki Takagi, Michihiko Minoh, and Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **Development of a recording system for radiograph diagnosis information with direct entry onto a displayed image** *Fuyuki Takahashi, Jun-ichi Hasegawa, Jun-ichirou Toriwaki*, Faculty of Engineering, Nagoya University; *Yoshio Takagi*, Higashi Nagoya National Hospital.
- **An Improvement of Automated Interpretation System for Digital Chest X-Ray Images and Effects of Spatial Frequency Enhancement on System Performance** *Osamu Hori, Jun-ichi Hasegawa, Jun-ichiro Toriwaki*, Faculty of Engineering, Nagoya University; *Yoshio Takagi*, Higashi Nagoya National Hospital.
- **High-precision surface formation and its 3-D shaded display of brain obtained from CT images** *Noboru Niki, Kiyofumi Higuchi, Tsutomu Yanase, Yoshizo Takahashi*, Faculty of Engineering, Tokushima University.
- **3-D Object Data Input Method Using Back Mirrors** *Takeshi Agui, Tomohito Saito, Masayuki Nakajima*, Imaging Science and Engineering Laboratory, Tokyo Institute of Technology.
- **Finding of Skewed-Symmetry Axes** *Weon Geun Oh, Minoru Asada, Saburo Tsuji*, Osaka University.
- **Planning of Observation by a Mobile Robot** *Makoto Tazumi, Masahiko Yachida, Saburo Tuji*, Osaka University.
- **On Region Attribute Description Method For Image Storage and Retrieval System of Textile Pattern** *Ken-ichi Arakawa, Yoshihiro Okada, Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **On Retrieval Method Using Color Name For Image Storage and Retrieval System of Textile Pattern** *Ken-ichi Arakawa, Yoshihiro Okada, Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **Adaptive Optimization of Color Masking Matrix** *Johji Tajima*, C&C Systems Research Laboratories, NEC Corporation.
- **Ray Tracing Algorithms in Computer Graphics** *Shigeki Yokoi, Jun-ichiro Toriwaki and Takami Yasuda*, Faculty of Engineering, Nagoya University.
- **Line Recognition of Hand Written Schematics Using Run-Length Data** *Masayuki Okamoto, Hiroyuki Okamoto*, Faculty of Engineering, Shinshu University.
- **An Experimental Implementation of English-Documents Filing System with Character Recognition** *Masayuki Okamoto, Masahito Tamai*, Faculty of Engineering, Shinshu University.
- **High Quality Kanji Font Database System** *Jun-ichi Kimura, Noriko Tohyama, Hideyoshi Tomimaga*, School of Science and Engineering, Waseda University.
- **Handwriting Image Data Detection from Video Image Input** *Hiroshi Arakawa, Masashi Yamazaki, Hideyoshi Tomimaga*, School of Science and Engineering, Waseda University.
- **CEPOC Encoder/Decoder Implementation and Its Evaluation** *Masakazu Sato, Masaki Yosida, Hideyoshi Tomimaga*, School of Science and Engineering, Waseda University.
- **The Extraction of Distance Using Image Clearness** *Moriyuki Matsuo, Katsumi Miyamae*, Toukai University.
- **A High Speed Stereo Image Matching System Based on Dynamic Programming** *Yuichi Ohta, Kenji Takano, Katsuo Ikeda*, Institute of Information Sciences and Electronics, University of Tsukuba.
- **Trinocular Vision using Edge Continuity and Local Features** *Yoshifumi Kitamura, Masatoshi Kimachi, Masahiko Yachida*, Faculty of Engineering Science, Osaka University.
- **Shape Analysis of Human Bodies Using Pseudodistance Measures** *Yukio Sato*, Nagoya Institute of Technology; *Emiko Tsutsumi*, Otsu Women's University.
- **Road Image Analysis** *Yuriko Ushioda, Hiroki Ohta, Shinji Ozawa*, NEC Corporation; Keio University.
- **Generalized Symmetry: Recovery of 3D curved surface based on Generalized Symmetry** *Toshimitsu Tanaka, Seiichiro Naito, Tokiichiro Takahashi, Isao Masuda*, NTT Electrical Communications Laboratories.
- **Computer Processing for 3-D display of Magnetic Resonance Images by use of multiplex holography** *Hiroshi Oshita, Shigeki Yokoi, Jun-ichiro Toriwaki* Faculty of Engineering, Nagoya University; *Michimasa Matsuo*, Nagoya City University, Medical School.
- **Study of Rendering Gems with Chatoyancy and Asterism by Computer Graphics** *Kosuke Kurashige, Shigeki Yokoi, Jun-ichiro Toriwaki*, Department of Information Engineering, Faculty of Engineering, Nagoya University.
- **A Mathematical Theory of Recognizing Patterns (Part V. Cognitive Termination and Cognitive Equivalence)** *Shoichi Suzuki*, Department of Information System, School of Information, Bunkyo University.
- **An Interactive Pattern Processing System With Control Modules For Recognition of Weld Defects in Radiographic Inspection** *Kazuhito Murakami, Hiroyasu Koshimizu*, Nagoya Municipal Industrial Research Institute; *Kinki Hawegawa*, Chukyo University.
- **Spoken English Sentence Recognition by Time-Synchronous Parsing Algorithm of Context-Free Grammar** *Sei-ichi Nakagawa*, Department of Information and Computer Sciences, Toyohashi University of Technology.
- **A Model-Controlled Method for Recognizing Penetrimeter in Radiographic Inspection of Weld** *H. Koshimizu*, Chukyo University; *K. Murakami, K. Hasegawa*, Nagoya Municipal Indust. Res. Inst.
- **Structure Analysis of Drawings Using Structural Knowledges** *Masashi Morimoto, Yasuo Arika, Toshiyuki Sakai*, Faculty of Engineering, Kyoto University.
- **A Model of Handwriting Process and its Evaluation** *Boonwat Attachoo and Shozo Kondo*, Faculty of Engr., Tokai Univ.
- **A Study on Similar Characters Discriminating by Quantification Theory** *Daisuke Nishiwaki*, Nihon University, Graduate School & College of Sci. & Tech., *Akiyoshi Itoh, Kenji Kawanishi*, Nihon University, Department of Electronic Engineering.
- **On The Probability Theoretical Interpretation of the Quantification Methods** *Takio Kurita, Hideki Aso, Nobuyuki Otsu*, Electrotechnical Laboratory.
- **Approximate Solutions to Weighted Graph Matching Problems Using Eigen-Expansion Approach** *Shinji Umeyama*, Electrotechnical Laboratory.
- **Can We Solve The Continuous Karhunen-Loeve Eigenproblem from Degraded Discrete Data?** *Hidemitsu Ogawa, Kouichi Tanaka*, Tokyo Institute of Technology, Department of Computer Science, Ookayama, Meguro-ku, Tokyo 152, Japan.

- A New Pattern Recognition Method Based on The Cartesian Join System *Manabu Ichino*, College of Science and Engineering, Tokyo Denki University.

## CALLS FOR PAPERS

### International Workshop on Industrial Applications of Machine Vision and Machine Intelligence

Roppongi, Tokyo, Japan - February 2-4, 1987

#### Program:

An International Workshop on Industrial Application of Machine Vision and Machine Intelligence will be held at the Institute of Industrial Science, the University of Tokyo, February 2-4, 1987.

The Workshop is co-sponsored by IEEE Industrial Electronics Society, and IIS (the Institute of Industrial Science, the University of Tokyo). The main objective of the workshop is to stimulate international and inter-fields discussions and attract high quality papers on current topics in these fields. The emphasis of the Workshop will be on practical and basic techniques applicable to Machine Vision, Machine Intelligence and Signal Processing as used in industries.

#### Program Topics:

The meeting will cover the following topics of interest:

- Vision Technology
- Image Processing, Image Understanding and their Industrial Applications
- Intelligent Robot, Inspection
- Image Database, Utility Management
- Industrial Applications of Graphics Technology, etc.
- AI Technology
- Industrial Applications of Artificial Intelligence
- Intelligent CAD, Diagnosis, etc.
- Signal Processing Technology
- Data Acquisition, Signal Processing
- Industrial Applications of Digital Signal Processor & Microprocessor

#### Deadlines:

Those wishing to present papers at the workshop have to submit 4 copies of a 400-word abstract, not later than September 1, 1986. Final manuscripts must be received by December 15, 1986.

#### Submission of Abstracts:

Prof. Masao Sakauchi  
Institute of Industrial Science  
University of Tokyo 22-1  
Roppongi 7-chome  
Minato-ku, Tokyo 106, Japan

### 1987 IEEE International Conference Robotics and Automation

Raleigh, North Carolina  
March 30 - April 3, 1987

#### Program:

Basic and applied papers in all areas of robotics and automation are solicited. The organizers encourage submission from representatives of industry, universities, research institutions, and government. The conference will host tutorials and workshops, in addition to conference sessions.

#### Program Topics:

Basic and applied papers in all areas of robotics and automation are solicited. Specific topics include, but are not limited to the following:

- Computer Vision in Robotics
- Robotic Sensing
- Robotic and Automation Systems Design
- Flexible Manufacturing Systems
- Simulation Languages
- Man-Machine Interface
- Mobile Robots
- Expert Systems in Design, Diagnosis, and Planning
- Application of Robotics

#### Deadlines:

October 1, 1986	4 Copies of Papers
December 15, 1986	Notification of acceptance
January 19, 1987	Final camera-ready papers

#### Submission:

Paper submission:

Arthur C. Sanderson  
The Robotics Institute  
Carnegie-Mellon University  
Schlenley Park  
Pittsburgh, PA 15213 USA

Proposals for tutorials, and workshop participation:

Prof. A. Desrochers  
Rensselaer Polytechnic Institute  
Electrical, Computer, & Systems Engineering  
Troy, NY 12180 USA

## 5th Scandinavian Conference on Image Analysis

Grand Hotel, Saltsjobaden - June 2-5, 1987

### Program Topics:

The meeting will cover the following topics of interest:

- Computer Vision
- Image Processing
- Pattern Recognition
- Perception
- Remote Sensing
- Industry
- Robotics
- Medicine and Biology
- Office Automation
- Systems and Hardware

### More Information:

For information concerning participation, please contact:

Dr. Torleiv Orhaug  
Conference Chairman  
National Defence Research Institute  
P.O. Box 1165  
S-581 11 Linköping  
Sweden

## The First International Conference on Computer Vision

London, England - June 8-11, 1987

### Program:

The program will consist of invited review papers and high-quality contributed papers on all aspects of computer vision. All papers will be referred by members of the Program Committee. To avoid conflicts, it is not planned to hold parallel sessions. A special feature of the program will be a set of invited talks on human perception and biological vision systems, as a continuation of the highly successful series of Workshops on Human and Machine Vision.

### The Conference:

ICCV is the first International Conference devoted solely to computer vision. It is sponsored by the IEEE Computer Society in cooperation with the International Association for Pattern Recognition (IAPR). It will be held in odd-numbered years, alternating with the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR).

### Deadlines:

December 15, 1986	4 complete drafts
early February	Notification of acceptance
early March	Final camera-ready copies

### Paper Submission:

Azriel Rosenfeld  
Center for Automation Research  
University of Maryland  
College Park, MD 20742

## Information Processing in Medical Imaging

Utrecht, The Netherlands - June 22-26, 1987

### Program:

The conference format will be workshop-like. Approximately 30 full papers and 10 works in progress will be presented. Extensive discussion of the contributions will be encouraged. The conference attendance will be limited to 100 participants.

### Program Topics:

- General image processing and analysis
- Pattern recognition and statistical methods
- Image display methodology
- New medical image formation methods
- 3D imaging and tomography
- Analysis of image time-series
- Expert systems
- Picture archiving and communication systems

### Deadlines:

November 15, 1986	Abstracts
March 1, 1987	Applications

**Information:**

Cornelis N. de Graf  
University Hospital  
K. 73078  
Catharijnesingel 101  
3511 GV Utrecht  
The Netherlands

**IV International Conference On:  
Image Analysis and Processing**

**Cefalu - Sicily, Italy - September 23-25, 1987**

**Program:**

The Conference is organized by the Italian Chapter of the IAPR and is sponsored by the Palermo University and the Italian National Research Council (CNR).

The aim of the conference is to cover both methodological and applicative aspects of pattern recognition and image processing.

**Program Topics:**

The meeting will cover the following topics of interest:

- Pattern Recognition
- Computer Vision and Image Processing
- Non conventional computer architectures for I.P.
- Language for image abstractions, processing and retrieval
- Theoretical methods and their relations with P.R.
- Applications in several fields are welcomed.

**Deadlines:**

December 31, 1986	Full paper (3 copies)
June 30, 1987	Final version

**More Information:**

Vito Di Gesu'  
Dipartimento di Matematica e Applicazioni  
Universita di Palermo  
90123, Palermo  
Italy

## Calendar of Events

<i>Date</i>	<i>Event</i>	<i>Location</i>	<i>Sponsor/Information</i>
Sept. 21 - Oct. 4, 1986	NATO Advanced Study Institute: Mathematics and Computer Science in Medical Imaging	Il Ciocco, Italy	Max A. Viergever, Delft University of Technology, Dept. of Mathematics & Information, P.O. Box 356, 2600 AJ Delft, The Netherlands, Tel: +31 15 784114
October 23-24, 1986	Analytical Methods in Remote Sensing for Geographic Information Systems	IBM Scientific Center, Paris	Dr. P.T. Nguyen IBM Scientific Center 36 ave Raymond Poincare 75116 Paris, France  Dr. D. Goodenough CCRS 1790 Woodward Drive Ottawa, Ontario K1A 0Y7 Canada
October 26-30, 1986	Fifth World Congress on Medical Informatics (MEDINFO 86)	Sheraton Washington Hotel, Washington, DC	MEDINFO 86 Organizing Committee c/o George Washington University Medical Center Office of Continuing Medical Education 2300 K Street, N.W. Washington, DC 20037
October 27-29, 1986	PRP 6: Conference on Instrumentation and Automation in the Paper, Rubber Plastics, and Polymerization Industries	Quaker Square Hilton, Akron, Ohio USA	Prof. A. Kaya, The University of Akron, Mechanical Engineering Dept., Akron, Ohio 44325 USA, Tel: (216) 375-7735, Telex: 279789 AZKA
October 27-31, 1986	Eighth International Conference on Pattern Recognition	Palais des Congres, PARIS, France	Sponsored by IAPR and AFCET, secretariat: M. F. Kalogera, 156 boulevard Pereire, 75017 PARIS, France
November 2-6, 1986	ACM - IEEE Computer Society 1986 Fall Joint Computer Conference	Infomart, Dallas, Texas USA	Dr. S. Winkler, Conference Chair FICC'86, IEEE Computer Society, 1730 Massachusetts Ave. NW, Washington, DC 20036-1903 USA, Tel: (202) 371-0101
December 2-6, 1986	Image Processing Symposium as part of the 2nd International Technical Symposium on Optical and Electro-Optical Applied Science and Engineering	Palais des Festivals et des Congres, Cannes, France	SPIE P.O. Box 10 Bellingham, WA 98227-0010  Association Nationale de la Recherche Technique 101, Avenue Raymond Poincare 75116 Paris, France
February 2-4, 1987	International Workshop on Industrial Applications of Machine Vision and Machine Intelligence	Roppongi, Tokyo, Japan	Prof. Masao Sakauchi, Institute of Industrial Science, University of Tokyo 22-1, Roppongi 7-chome, Minato-ku, Tokyo 106, Japan
Mar. 30 - Apr. 3 1987	1987 IEEE International Conference on Robotics and Automation	Radison Hotel and Civic Center, Raleigh, NC, USA	Harry Hayman, 738 Whitaker Terrace, Silver Spring, MD 20901, USA
June 2-5, 1987	5th Scandinavian Conference on Image Processing	Grand Hotel, Saltsjobaden, Sweden	Dr. Torleiv Orhaug, Conference Chairman, National Defense Research Institute, P.O. Box 1165, S-581 11 Linkoping, Sweden
June 8-11, 1987	The First International Conference on Computer Vision	London, England	Papers to: Azriel Rosenfeld, Center for Automation Research, University of Maryland, College Park, MD 20742
June 22-26, 1987	Information Processing in Medical Imaging	Utrecht, The Netherlands	Cornelis N. de Graf, University Hospital, K. 73078, Catharijnesingel 101, 3511 GV Utrecht, The Netherlands, Tel: +31 30 372846
Sep. 23-25, 1987	IV International Conference on: Image Analysis and Processing	Cefalu, Sicily, Italy	Vito Di Gesu, Dipartimento di Matematica e Applicazioni, Universita di Palermo, 90123, Palermo, Italy



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