INTERNATIONAL ASSOCIATION FOR PATTERN RECOGNITION

IAPR Newsletter

Volume 35, Number 1
January/February 2013

ICPR 2012 Special Issue

Calls for Papers on Page 2

In this issue...

Getting to know...Professor Rama Chellappa, IAPR Fellow ..... Page 3
Professor Rama Chellappa, recipient of the 2012 K. S. Fu Prize, shares his recollections of learning from and working with many pattern recognition and computer vision pioneers, including Professor King-Sun Fu!

ICPR Highlights ..... Page 8
The 21st International Conference on Pattern Recognition was held in Tsukuba, Japan, November 11-15, 2012. Share in some of the highlights!

From the ExCo ..... Page 17
Ingela Nyström, IAPR Secretary, shares news from the IAPR Executive Committee.

In Memoriam: Maria Petrou, IAPR Fellow.... Page 18
Maria Petrou, a leading authority on image processing, passed away on October 15, 2012. Josef Kittler has written about many of her interests, achievements and awards.

CfP—Pattern Recognition Letters Special Edition: Celebrating Maria Petrou ..... Page 20

INSIDE the IAPR: IAPR Newsletter Editorial Staff Changes..... Page 21
Arjan Kuijper is the new Editor-in-Chief and Zeeshan Zia is the new Associate Editor for Book Reviews. Read what they have to say about their new positions.

BOOKS BOOKS BOOKS
Arjan Kuijper reviews ***Biodata Mining and Visualization Novel Approaches*** by Ilkka Havukkala.....Page 23

K. S. Fu Prize Lecture Series .....Page 25
Kevin Bowyer and Horst Bunke give a summary of the 2012 edition of the K. S. Fu Prize Lecture Series held at Notre Dame University. The lecture series will continue in 2013!

IAPR Conference and Workshop Reports:

- **S+SSPR 2012: Joint IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR 2012) and Statistical Techniques in Pattern Recognition (SPR 2012)** .....Page 27

Of Interest… ..... Page 30
A Call for Book Chapters and Free books available for review.

Meeting and Education Planner..... Page 32
Chart of some upcoming IAPR and non-IAPR workshops, conferences, and summer schools of interest to the IAPR community.

Calls for Papers

Biometrics Summer School
10th Summer School for Advanced Studies on Biometrics for Secure Authentication
Alghero, Italy
Deadline: February 15, 2013
June 10-15, 2013

ICIAP 2013
International Conference on Image Analysis and Processing
Naples, Italy
Deadline: March 8, 2013
September 11-13, 2013

GREC 2013
10th IAPR International Workshop on Graphics Recognition
Bethlehem, PA, USA
Deadline: March 31, 2013
August 20-21, 2013

CAIP 2013
15th International Conference on Computer Analysis of Images and Patterns
York, UK
Deadline: April 1, 2013
August 27-29, 2013

ACPR 2013
2nd IAPR Asian Conference on Pattern Recognition
Okinawa, Japan
Deadline: June 10, 2013
November 5-8, 2013

CIARP 2013
18th Iberoamerican Congress on Pattern Recognition
Havana, Cuba
Deadline: June 15, 2013
November 20-23, 2013

ICPR 2014
22nd International Conference on Pattern Recognition
Stockholm, Sweden
Deadline: December 20, 2013
August 24-28, 2014

ICFHR 2014
14th International Conference on Frontiers in Handwriting Recognition
Crete, Greece
Deadline:
2014

Call for Submissions

IAPR Newsletter

Articles, announcements, book reviews, conference and workshop reports

Contact the editor:
Arjan Kuijper, *arjan.kuijper@igd.fraunhofer.de*

Deadline: March 22, 2013

IAPR Newsletter

Published in association with the IAPR website, *www.iapr.org*

IAPR Newsletter Publication Schedule:

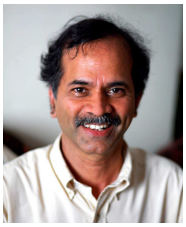
The IAPR Newsletter is published four times per year during the third week of January, April, July, and October.

To contact us:

Editor in Chief:
Arjan Kuijper
arjan.kuijper@igd.fraunhofer.de
www.gris.tu-darmstadt.de/~akuijper/

Associate Editor for Book Reviews:
Zeeshan Zia
mzia@ethz.ch
www.igp.ethz.ch/photogrammetry/people/mzia

Layout Editor:
Linda J. O'Gorman
logorman@alumni.duke.edu



FEATURE: Getting to know...Rama Chellappa,IAPR Fellow

Learning from the Pioneers

By Rama Chellappa, IAPR Fellow (USA)

Professor Ramalingam Chellappa, IAPR Fellow

ICPR 1996, Vienna, Austria

For contributions to theory and applications of Markov Random Fields and computer vision

I am very fortunate to have been taught by the best in the fields of Pattern Recognition and Computer Vision. Their formal and informal teaching and guidance have had great impact on how my academic career has developed. In this brief article, I describe my interactions with my teachers while I was a graduate student at Purdue University and the University of Maryland as well as my early research and how it incorporated their influence and guidance. In doing so, I hope to shed some light on the brilliance, innovative spirit, work ethic and generosity of my teachers who also happen to be the pioneers in these fields.

I was introduced to statistical pattern recognition in Spring 1977, when I took a course on this topic at the Indian Institute of Science (IISc). Not knowing much about the topic, I took this course because the instructor Prof. M.A.L. Thathachar was known as an outstanding scholar and teacher. My interest in pattern recognition was sparked by the well delivered lectures of Prof. Thathachar; and as a result, I got interested in doing my doctoral studies in pattern recognition. If one were interested in pattern recognition, the Electrical Engineering Department (as it was known then) at Purdue University was the place to be, in those days. The faculty roster included Profs. R. L. Kashyap, King-Sun Fu, Ken Fukunaga, Tom Huang, and E.A. Patrick.

I was fortunate to get a research assistantship from Prof. R. L. Kashyap to pursue my doctoral studies. I am singularly fortunate to have taken classes in pattern

(Continued on page 4)

Prof. Rama Chellappa received the B.E. (Hons.) degree in Electronics and Communication Engineering from the University of Madras, India, in 1975 and the M.E. (with Distinction) degree from the Indian Institute of Science, Bangalore, India, in 1977. He received the M.S.E.E. and Ph.D. Degrees in Electrical Engineering from Purdue University, West Lafayette, IN, in 1978 and 1981 respectively. During 1981-1991, he was a faculty member in the department of EE-Systems at the University of Southern California (USC). Since 1991, he has been a Professor of Electrical and Computer Engineering (ECE) and an affiliate Professor of Computer Science at the University of Maryland (UMD), College Park. He is also affiliated with the Center for Automation Research, the Institute for Advanced Computer Studies (Permanent Member) and is serving as the Chair of the ECE department. In 2005, he was named a Minta Martin Professor of Engineering. His current research interests are face recognition, clustering and video summarization, 3D modeling from video, image and video-based recognition of objects, events and activities, dictionary-based inference, compressive sensing, domain adaptation and hyper spectral processing.

Prof. Chellappa received an NSF Presidential Young Investigator Award, four IBM Faculty Development Awards, an Excellence in Teaching Award from the School of Engineering at USC, and two paper awards from the International Association of Pattern Recognition (IAPR). He is a recipient of the K.S. Fu Prize from the IAPR. He received the Society, Technical Achievement and Meritorious Service Awards from the IEEE Signal Processing Society. He also received the Technical Achievement

(Continued on page 4)

(Continued from page 3)

recognition from Profs. Kashyap, Fu, and Fukunaga. In Fall 1977, I took a course titled Introduction to Decision and Control Under Uncertainty from Kashyap, which covered time series models, parameter estimation, Bayesian information criterion, and stochastic filtering. Kashyap was at his best while teaching Bayesian inference. This course laid the foundations for my doctoral work on 2-D Markov random field (MRF) and non-causal autoregressive models. The love for MRFs has not left me and my students, and we seem to be coming back to them on and off.

In Spring 1978, I took the course, titled Artificial Intelligence, from Prof. Fu. The course material was equally divided among statistical pattern recognition, syntactic pattern recognition, and introductory material on artificial intelligence. Artificial Intelligence (AI) was a new field then and teachers liked to include AI in pattern recognition courses. Prof. Fu was a dynamic teacher. I also audited a course on image processing taught by Prof. Tom Huang in Spring 1978. Prof. Huang came to the class carrying a mug of coffee and without any notes. His lectures were enjoyable and quite technical at the same time.

In Fall 1978, I took a statistical pattern recognition course from Prof. Fukunaga, who used to bring his book and put it on the table, put a piece of chalk in a silver holder and write almost the entire book on the board! Prof. Fukunaga's course had the official title, Introduction to Artificial Intelligence, but after the first introductory lecture, it was all about statistical pattern recognition. What I remember from his course is that he gave no homework, but gave several tests! Prof. Fukunaga's gift was in teaching even complicated concepts such as deriving the probability of error for general non-linear classifiers in a simple manner. It was apparent that he loved estimating errors bounds for different classifiers and somehow made these derivations look easier!

Prof. Fu also taught a course on Introduction to Formal Languages in Fall 1978, which introduced finite-state, context-free and context-sensitive grammars, their parsers, stochastic grammars and how to develop syntactic pattern recognition systems. He was fond of discussing the challenges in inferring the production rules for a given pattern recognition problem. His passion for structural and syntactic methods came through at every lecture.

(Continued on page 5)

(Continued from page 3)

and Meritorious Service Awards from the IEEE Computer Society. At UMD, he was elected as a Distinguished Faculty Research Fellow, as a Distinguished Scholar-Teacher, received an Outstanding Innovator Award from the Office of Technology Commercialization, and an Outstanding GEMSTONE Mentor Award from the Honors College. He received the Outstanding Faculty Research Award and the Poole and Kent Teaching Award for Senior Faculty from the College of Engineering. In 2010, he was recognized as an Outstanding ECE by Purdue University. He is a Fellow of IEEE, IAPR, OSA and AAAS. He holds three patents.

Prof. Chellappa served as the Editor-in-Chief of IEEE Transactions on Pattern Analysis and Machine Intelligence. He has served as a General and Technical Program Chair for several IEEE international and national conferences and workshops. He is a Golden Core Member of the IEEE Computer Society and served as a Distinguished Lecturer of the IEEE Signal Processing Society. Recently, he completed a two-year term as the President of the IEEE Biometrics Council.

(Continued from page 4)

Despite a heavy travel schedule, Prof. Fu rarely missed his lectures.

During the 3.5 years I spent at Purdue, I also took courses on mathematical statistics, multivariate analysis, a seminar on multivariate analysis (all taught by the veteran statistician Prof. K.C.S. Pillai). In addition, I took a course on non-parametric methods and audited a course on discrete decision theory and an advanced version of it taught by Prof. Jim Berger. The Purdue statistics department was quite strong on decision theory in those days with the likes of Prof. Shanti Gupta, Jim Berger and Herman Rubin on the faculty. I recall a symposium on decision theory held at Purdue in the summer of 1981. Prof. C.R. Rao was an honored guest and gave a fantastic talk, and I was the honored Chauffer who gave him a ride from a party to the Purdue Memorial Union where he was staying, and in return he signed my copy of his book on Linear Statistical Inference. I was awed by the reverence everyone at the meeting showed to Prof. C.R. Rao.

After receiving a Master's degree in EE in December 1978, I joined Prof. Azriel Rosenfeld's group at UMD to pursue computer vision research and get a Ph.D. in Computer Science. After a semester at UMD, I decided to return to Purdue in Summer 1979 to get my Ph.D. in EE under the supervision of Prof. Kashyap. Azriel, being the gentleman he was, continued to support me as a Faculty Research Assistant at UMD, while I was a Graduate Research Assistant and Instructor at Purdue. Azriel served on my Ph.D. proposal and dissertation committees and visited Purdue to attend these exams. I visited his lab during winter and summer breaks and wrote several reports published by the Computer Vision Laboratory at UMD. The day of my defense was exciting as Profs. Kashyap, Fu and Rosenfeld invited me to join them for lunch before the exam. Azriel gave a talk at Purdue after my exam using just one transparency foil!

In Fall 1977 and Spring 1978, I worked on the Bayesian model order selection problem for autoregressive and moving average models (ARMA), extending Kashyap's work on Bayesian comparison of time series models which appeared in IEEE Transactions on Automatic Control in 1977, several months before the work of G. Schwartz which appeared in Annals of Statistics in 1978. One of the results I learned for handling the messy likelihood function of an ARMA model was the Gaussian approximation of the ARMA likelihood function which is referred to as Laplace's approximation result. Kashyap made me read the book on asymptotic expansion by Erdelyi which contains many approximations that can be useful. During my doctoral work on stochastic models for image processing and analysis, Kashyap's guidance was invaluable in deriving parameter estimation and neighborhood selection rules for 2-D MRF models and 2-D non-causal spatial models. We were all excited by the papers of famous statisticians such as P. Whittle (Biometrika, 1954) and J. Besag (JRS-B, 1974) and explored the applications of their work for texture analysis, image restoration, and classification. Although MRF models are not being used much for synthesis and analysis problems, the inference methods inspired by MRF models are being used even today in computer vision. As an example, one can point to the recent work known as Make 3D and a face alignment algorithm developed by one of my students.

At the Image Modeling workshop organized by Azriel in June 1979, Prof. Fu introduced me to a representative from Springer, who was looking for a graduate student to go over the manuscript on

(Continued on page 6)

(Continued from page 5)

Pattern Classifiers and Trainable Machines by Profs. Jack Sklansky and Gustav Wassel. I had the pleasure of reading this book before it was printed. I offered to write a brief section on the role of sufficient statistics and Bayesian learning. Jack generously agreed to include this section in his book. This fine gesture by one of the leading researchers taught me how to encourage and mentor my students and younger colleagues.

While I appreciate the high quality instruction I received from the pioneers mentioned above, what I truly appreciate is the impact Profs. Kashyap and Rosenfeld had on me as I worked very closely with them. Kashyap took it upon himself to improve my analytical skills and the quality of my technical writing. He introduced me to many classical books on decision theory and made me write every paper I wrote with him numerous times. He was never tired of editing my papers and suggesting improvements. The first position paper on optimal decision rules I wrote for him in Fall 1977 was edited more than ten times. At one of meetings in the first few weeks of my joining Purdue, Kashyap suggested I buy Scotch tape, scissors and a mechanical pencil. As each revision was done, there would be more and more cutting and pasting from earlier versions, so that the entire paper need not be rewritten for the next reading. Thus, as the iterations proceeded, one had more to cut and paste and less to add. This was Kashyap's way of instilling a passion for technical writing which is a must for a successful academic career.

I spent nearly fifteen years with Azriel, first as his student in Spring 1979, and then as a faculty research assistant during August 1979 - August 1981 while I was a graduate research assistant at Purdue. I also spent an additional 12.5 years as his colleague at UMD (during 1991-2004). Azriel was one of the hardest working and most brilliant professors I have known. He rarely took vacations and spent close to 16 hours/day on writing, reading and thinking, and lecturing computer vision and other subjects that interested him. He was such a prolific writer; he wrote a technical report while we were on an excursion trip from Bangalore to Mysore (~110 miles) in India in January 1988. He published this work a bit later. He also patiently edited all the papers written by his students, colleagues, and visitors. Every night, he used to carry home many papers, which he would edit till late at night and bring the edited versions the following day. If for some reason, he could not complete editing all of them, he was always very apologetic. Despite managing several large grants and managing a Center, he regularly met his students and advised them. He was known for taking red eye flights from the west coast often and coming to work for a full day of work. Traveling with him to conferences and other meetings was a blast as he had a good sense of humor. Above all he took immense pleasure in mentoring young researchers and making them better in what they do. The computer vision field benefitted enormously by his vision, work ethic, and integrity.

Although my interactions with Prof. Fu were mostly through his classes and his participation as a member of my MS and Ph.D. committees, he had an enormous influence on me and other students as well as numerous colleagues. When he was in town, you could see him in his office poring over his papers late at night. As a result, most of us who were students in the Advanced Automation Research Laboratory directed by him were also motivated to work nights and weekends.

My interactions with Prof. Tom Huang deepened when I got interested in structure from motion problems in the mid eighties. Since then, Tom has been a great mentor to me and many other

(Continued on page 7)

(Continued from page 6)
researchers. His continued passion for research and scholarship is an inspiration to all of us.

I feel the training I received from the pioneers mentioned above during my years as a student has helped me a great deal to accomplish whatever little I have been able to do. They taught me how to teach, do research, and advise and mentor students. I am truly grateful to them.

I am also fortunate to enjoy collegial interactions with many leading researchers in image processing, computer vision and pattern recognition. In addition to being taught by the best, I have been very lucky in getting several tens of outstanding students who, over the years have tirelessly taught me all the new things they were working on. I just cleverly positioned myself between outstanding teachers and smart students, and it has been a great ride. My only regret is that I have not had an opportunity to study under Prof. Ulf Grenander, who pioneered pattern theory, or Prof. David Mumford, who brought rigorous mathematics to computer vision, even for a summer. This would have completed my career. I do read their books on and off and hopefully one day I will understand some of their research findings.

Feature Article

Congratulations to the 2012 IAPR Fellows and to the recipients of Awards at ICPR 2012!

The Feature Article in this issue of the *IAPR Newsletter* presents abstracts from the plenary talks, and lists of IAPR award winners.

Plenary Talk Abstracts:

- **K. S. Fu Prize Lecture:** ***Dictionaries, Manifolds and Domain Adaptation Methods: New Solutions to Old Problems in Pattern Recognition*** By Rama Chellappa, IAPR Fellow (USA) ..... Page 9
- **J. K. Aggarwal Prize Lecture:** ***Generalized Principal Component Analysis (GPCA) and Sparse Subspace Clustering (SSC)*** By René Vidal (USA) ..... Page 10
- **Keynote Lecture:** ***First-Person Vision*** By Takeo Kanade (Japan)..... Page 10

Invited Talk Abstracts:

- ***Pursuit of Low-dimensional Structures in High-dimensional Data*** By Yi Ma (China) ..... Page 11
- ***Interest Points Detectors and Descriptors in Image Recognition*** By Krystian Mikolajczyk (UK) ..... Page 11
- ***Patient and Process Specific Imaging and Visualization for Computer Assisted Interventions*** By Nassir Navab (Germany) ..... Page 12
- ***Three Approaches of Scene Text Recognition: An informal comparison on difficult images*** By Jin Hyung Kim (Korea)..... Page 12

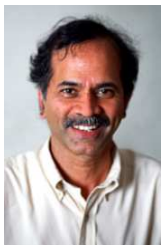
Banquet Opening Remarks ..... Page 13

2012 IAPR Fellows ..... Page 14

ICPR 2012 Paper Awards..... Page 15

Feature Article
Plenary Talk Abstracts

K.S. Fu Prize Lecture:
Dictionaries, Manifolds and Domain Adaptation Methods: New Solutions to Old Problems in Pattern Recognition



Rama Chellappa, IAPR Fellow (USA)

Abstract: Feature extraction or representation of patterns and adaptation of classifiers designed using training data to be effective on testing data are two fundamental problems in pattern recognition. In this talk, I will discuss new solutions to these problems based on theories of dictionary learning, analytic manifolds and domain adaptation with applications in image and video-based recognition. Specifically, I will discuss methods for representing images and videos using linear and non-linear dictionaries and analytical manifolds. I will then discuss methods for adapting the dictionaries and manifold representations for addressing shifts in data distributions due to changes in pose, illuminations, spatio-temporal sampling and blur with applications in recognition of faces, expressions, objects and actions.

Plenary talk abstracts continue on Page 10

Feature Article
Plenary Talk Abstracts (continued)

J. K. Aggarwal Prize Lecture:
Generalized Principal Component Analysis (GPCA) and Sparse Subspace Clustering (SSC)

René Vidal (USA)

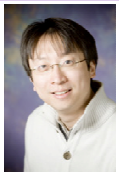
Abstract: In the era of data deluge, the development of methods for discovering structure in high-dimensional data is becoming increasingly important. Traditional approaches often assume that the data is sampled from a single low-dimensional manifold. However, in many applications in signal/image processing, machine learning and computer vision, data in multiple classes lie in multiple low-dimensional subspaces of a high-dimensional ambient space. In this talk, I will present methods from algebraic geometry, sparse representation theory and rank minimization for clustering and classification of data in multiple low-dimensional subspaces. I will show how these methods can be extended to handle noise, outliers as well as missing data. I will also present applications of these methods to video segmentation and face clustering.

Keynote Lecture:
First-Person Vision

Takeo Kanade (Japan)

Abstract: For understanding the behavior, intent, and environment of a person, the surveillance metaphor is traditional; that is, install cameras in the environment and observe her and her interaction with other people and environment from them. Instead, we argue that the First-Person Vision that senses the environment and her activities from her point of view is more advantageous with available images about her environment from her own view points and with readily available information about her head motion and gaze. We have been working in this paradigm for a while, and this talk will present the current progresses in the First Person Vision - the ideas, devices, algorithms, and example applications.

Feature Article
Invited Talk Abstracts



Pursuit of Low-dimensional Structures in High-dimensional Data

Yi Ma (China)

Abstract: In this talk, we will discuss a new class of models and techniques that can effectively model and extract rich low-dimensional structures in high-dimensional data such as images and videos, despite nonlinear transformation, gross corruption, or severely compressed measurements. This work leverages recent advancements in convex optimization for recovering low-rank or sparse signals that provide both strong theoretical guarantees and efficient and scalable algorithms for solving such high-dimensional combinatorial problems. These results and tools actually generalize to a large family of low-complexity structures whose associated (convex) regularizers are decomposable. We illustrate how these new mathematical models and tools could bring disruptive changes to solutions to many challenging tasks in computer vision, image processing, and pattern recognition. We will also illustrate some emerging applications of these tools to other data types such as web documents, image tags, microarray data, audio/music analysis, and graphical models.

This is joint work with John Wright of Columbia, Emmanuel Candes of Stanford, Zhouchen Lin of Peking University, and my students Zhengdong Zhang, Xiao Liang of Tsinghua University, Arvind Ganesh, Zihan Zhou, Kerui Min and Hossein Mobahi of UIUC.

Interest Points Detectors and Descriptors in Image Recognition

Krystian Mikolajczyk (UK)

Abstract: Much research in computer vision and pattern recognition is focused on developing new approaches for popular bags of visual words models such as interest point detectors, descriptors, spatio-temporal representations, codebook and coding schemes as well as classifiers. In this talk, I will present our recent projects on image and video recognition where interest points and local descriptors play a crucial role. I will present our recent approaches to extract and represent spatio-temporal characteristics of local features, in particular, their appearance-motion history captured from a moving camera. I will also discuss the machine learning techniques we apply to improve discriminative capabilities of local descriptors or fuse information from various feature channels to maximize recognition performance. These, as well as the process of designing the recognition approach to meet the application requirements will be discussed in the context of several applications including object detection from UAVs, sport recognition, mood classification and animal identification.

Invited talk abstracts continue on Page 12

Feature Article
Invited Talk Abstracts (continued)

Patient and Process Specific Imaging and Visualization for Computer Assisted Interventions

Nassir Navab (Germany)

Abstract: In this talk, I first focus on the needs for development of novel techniques for patient and process specific intra-operative imaging and visualization and present some of our latest results as exemplary cases. As novel intra-operative and multi-modality imaging techniques provide the surgical crew with rich co-registered information, their appropriate visualization and their integration into surgical workflow, their validation and finally their full deployment are becoming active subjects of research in our community. Pattern recognition, computer vision and machine learning techniques are further developed to help recovering and modeling surgical procedures and providing innovative solutions. I will in particular trace the Freehand SPECT and Camera Augmented Mobile C-arm (CAMC) from the early development of research ideas within our multi-disciplinary research laboratories to their deployment in different surgical suites. I will finally show how the 'real world laboratories' at our university hospitals demonstrate their efficiency through the smooth path they pave for bringing advance imaging and visualization techniques into the surgical theatres.

Three Approaches of Scene Text Recognition: An informal comparison on difficult images

Jin Hyung Kim (Korea)

Abstract: Three KAIST approaches for scene text recognition will be presented in this talk: color-based, edge-based, and part-based approaches. Although features of color, edge and part-relationship are utilized in all of the three approaches, there are differences on the main focus in each of these approaches. The color-based approach focuses on image segmentation mainly based on color, while the edge-based approach focuses on edge following to extract text objects. The part-based approach is an attempt to directly pin point existence of character parts in image. Each of the three approaches has merits and demerits. The text extraction results of the three approaches will be shown on some representative images known 'difficult' in the community. So, one may feel how the approaches will behave in other difficult images.

Feature Article
Banquet Opening Remarks

Thank you to Steven L. Tanimoto Co-General Chair of ICPR 2012 for sharing with the IAPR Newsletter community the remarks he delivered at the ICPR 2012 banquet. *~A. Kuijper, ed.*

Steve Tanimoto, Co-General Chair, welcomes delegates and guests to the ICPR2012

Good evening; konban-wa!

As co-general chair, I have the pleasure and great honor to welcome you to the conference banquet. The ICPR has a long tradition of promoting exchange of ideas and personal contacts through both the technical program and the social program.

As perhaps the only attendee here who also attended the first IJCPR in Washington, D.C. in 1973, let me tell you how things have changed. The late Professor King-Sun Fu, the general chair, was 43 years old. There were only 89 papers. Now we have not only 313 oral presentation papers, but also 629 posters. This increase, by a factor of 10.58, is remarkable. Back in 1973, there were only 312 participants. Now, over 1200. It was at the Mayflower Hotel in Washington, D.C., quite modest compared with the Tsukuba Epochal Congress Center.

I hope all you international visitors are enjoying Japan. There's such a wonderful combination of exotic and modern. With the shinkansen bullet trains, Japan broke new ground. With the most advanced user interface in the bathroom, the toilet technology here is unsurpassed. If you haven't tried it, make a point to do so before you leave. And our Tsukuba Epochal Congress Center has been a fabulous venue for this conference.

Before we drink the sake, I want to thank the full organizing committee and all of you who worked so hard to make this conference a reality. That includes first and foremost our Japanese co-chair, Professor Yuichi Ohta of Tsukuba University's Department of Intelligent Interaction Technologies. To Ohta-sensei, our great thanks!

My time is limited, but I want to name a few folks --- my co-chair Jan-Olof Eklundh, and the program chairs Alberto del Bimbo, incoming IAPR President Kim Boyer, and especially Professor Katsu Ikeuchi, who had the misfortune to break an ankle just before the conference but did so much towards the program. And all the track chairs, and so many other organizers. And all of you -- authors, referees, attendees, staff, sponsors, and guests. Arigato Gozaimashita; Thank you!

Before I give up the microphone, I'd like to sum up the spirit for tonight with a couple of limericks, if you will kindly indulge me.

> The twenty-first I. C. P. R.
> In Tsukuba, Japan's where we are.
> The program's been fine,
> But let's now drink rice wine,
> Before travelling home from afar.
>
> The Tsukuba team have been great hosters
> For Pattern Recognition papers and posters,
> And we'll long remember
> That time in November
> When sake was drunk by us toasters.

Welcome to the banquet!

General Co-Chairs (from left) Yuichi Ohta, Steve Tanimoto, and Jan-Olof Eklundh perform the ritual breaking of the cover of a sake barrel, the ceremony known as Kagami-Wari, which is used to begin a big celebration.

Feature Article
2012 IAPR Fellows

The prestigious IAPR Fellow Award was introduced in 1994 and since then is biennially conferred on persons to acknowledge their distinguished contributions to the field of pattern recognition and to IAPR activities.

According to the Constitution and Bylaws of IAPR, the number of fellows elected every two years must not exceed 0.25% of the total IAPR membership. Both service to IAPR and scientific contributions to the field of pattern recognition are taken into account in the selection process.

The IAPR Fellow Committee solicits nominations of high quality and performs the selection process.

The 2012 IAPR Fellow Committee:

Mark Nixon, IAPR Fellow (Chair)
Narendra Ahuja, IAPR Fellow
Walter Kropatsch, IAPR Fellow
Sudeep Sarkar, IAPR Fellow
Svetha Venkatesh, IAPR Fellow
Wenyin Liu, IAPR Fellow

Kevin Wilson Bowyer
For contributions to computer vision, pattern recognition and biometrics

John Gustav Daugman
For contributions to computer vision, pattern recognition and biometrics

Andrew William Fitzgibbon
For contributions to 3D computer vision research and its applications

David Crossland Hogg
For contributions to learning in activity analysis and computer vision

Qiang Ji
For contributions to face image analysis and applications

Ludmila Ilieva Kuncheva
For contributions to multiple classifier systems

Cheng-Lin Liu
For contributions to character recognition and document analysis, and services to the IAPR

Salil Prabhakar
For contributions to biometrics technology

Yong Rui
For contributions to visual pattern analysis, recognition and retrieval

Jose Ruiz-Shulcloper
For contributions to pattern recognition and data mining, and services to the IAPR

Nicu Sebe
For contributions to human behaviour understanding and multimedia

Chew Lim Tan
For contributions to document analysis, and services to the IAPR

Dacheng Tao
For contributions to pattern recognition and image understanding

Philip Hilaire Torr
For contributions to robust computer vision

Jun Wang
For contributions to neurodynamics and its applications

Qiang Yang
For contributions to data mining and transfer learning

Zhi-Hua Zhou
For contributions to machine learning, data mining and pattern recognition

Feature Article
ICPR 2012 Paper Awards

Best Industry-Related Paper
Stephen Pollard, Steven Simske and Guy Adams
for the 21st ICPR paper
Print Biometrics: Recovering Forensic Signatures from Halftone Images

Piero Zamperoni Best Student Paper Award
Xiaoyang Wang
for the 21st ICPR paper
Incorporating Contextual Knowledge to Dynamic Bayesian Networks for Event Recognition
by Xiaoyang Wang and Qiang Ji

Best Scientific Paper Award: Computer and Robot Vision
Alexander Schick, Mika Fischer and Rainer Stiefelhagen
for the 21st ICPR paper
Measuring and Evaluating the Compactness of Superpixels

Best Scientific Paper Award: Virtual Reality and Medical Applications
Jialin Peng, Jinwei Wang and Dexing Kong
for the 21st ICPR paper
A New Convex Variational Model for Liver Segmentation

Best Scientific Paper Award: Pattern Recognition and Applications
Radu Timofte and Luc Van Gool
for the 21st ICPR paper
Weighted Collaborative Representation and Classification of Images

Best Scientific Paper Award: Signal, Speech and Image/Video Processing
Guifang Duan, Hongcui Wang, Zhenyu Liu, Junping Deng and Yen-Wei Chen
for the 21st ICPR paper
K-CPD: Learning of Overcomplete Dictionaries for Tensor Sparse Coding

Best Scientific Paper Award: Document Analysis
Stephen Pollard, Steven Simske and Guy Adams
for the 21st ICPR paper
Print Biometrics: Recovering Forensic Signatures from Halftone Images

(Continued on page 16)

Feature Article
ICPR 2012 Paper Awards (continued)

(Continued from page 15)

ICPR2012 Best Student Paper Award: Computer and Robot Vision
(Partially Sponsored by IBM Research)
Jia-Bin Huang
for the 21st ICPR paper
Saliency Detection via Divergence Analysis: A Unified Perspective
by Jia-Bin Huang and Narendra Ahuja

ICPR2012 Best Student Paper Award: Virtual Reality and Medical Applications
(Partially Sponsored by IBM Research)
Lin Gu
for the 21st ICPR paper
Shadow Detection via Rayleigh Scattering and Mie Theory
by Lin Gu and Antonio Robles-Kelly

ICPR2012 Best Student Paper Award: Pattern Recognition and Applications
(Partially Sponsored by IBM Research)
Meng Fang
for the 21st ICPR paper
I don't know the label: Active Learning with Blind Knowledge
by Meng Fang and Xingquan Zhu

ICPR2012 Best Student Paper Award: Signal, Speech and Image/Video Processing
(Partially Sponsored by IBM Research)
Takuhiro Kaneko
for the 21st ICPR paper
Consistent Collective Activity Recognition with Fully Connected CRFs
by Takuhiro Kaneko, Masamichi Shimosaka, Shigeyuki Odashima, Rui Fukui and Tomomasa Sato

ICPR2012 Best Student Paper Award: Document Analysis
(Partially Sponsored by IBM Research)
Jayant Kumar
for the 21st ICPR paper
Learning Document Structure for Retrieval and Classification

News from the
IAPR Executive Committee

by Ingela Nyström **(Sweden)**

We hope that you enjoyed the ICPR 2012 in Tsukuba last November. The theme of this *IAPR Newsletter* is to report on the successful conference. We congratulate and thank the ICPR 2012 Organizing Committee for preparing the conference. The next edition of the conference, ICPR 2014, is the 22th in the series and will be held in Stockholm, Sweden, from August 24-28. Cancun in Mexico has been selected by the IAPR Governing Board as the venue for ICPR 2016.

It is my pleasure to welcome two new IAPR member societies: the Macau Society of Pattern Recognition and Image Processing and the Uruguayan Association for Pattern Recognition. The memberships were approved at the last Governing Board meeting. Their contributions to the IAPR will be greatly appreciated. Herewith, our Association now consists of 45 member societies and the Governing Board has 59 members.

The IAPR financial situation continues to be good. Given this fortunate situation and that there was a large number of IAPR Stipend applications to attend ICPR in Tsukuba (accepting only 40 out of the 265), the Governing Board decided to increase the IAPR Stipend budget.

This is the first "From the ExCo" column written by the new Executive Committee. We look forward to working with the IAPR community for the next two years. We extend our warmest thanks to the past Past President Brian Lovell for his work as member of the ExCo. Although he is no longer an ExCo member, we are convinced that he will continue to participate in IAPR activities.

The newly appointed ExCo has started to work on a number of issues. One task in the months after ICPR is to set up the standing committees and to appoint Technical Committee chairs for this new term. According to IAPR's Constitution and Bylaws, the Nominating Committee, the King Sun Fu Prize Committee, and the J. K. Aggarwal Prize Committee need a vote by the Governing Board. The ballot will be initiated soon, and we will report on its result in a future issue of the newsletter. All committee members will be listed at the IAPR web site, *www.iapr.org/*, after appointment.

IAPR Executive Committee 2012-2014

Kim Boyer
President

Tieniu Tan
1st Vice President.

Apostolos Antonacopoulos
2nd Vice President

Aytül Erçil
Treasurer

Ingela Nyström
Secretary

Denis Laurendeau
Past President

In fact, we encourage you to visit the IAPR web site on a regular basis. There is plenty of information there to be found thanks to our webmaster Edward Sobczak. Even though 2013 is not an ICPR year, there are many other conferences and workshops taking place that are supported by IAPR. Go to *www.iapr.org/conferences/*, where you can find all upcoming IAPR-supported conferences, workshops and summer schools. In fact, there are a number of meetings with submission deadline within the next few months, for example, the Biometrics Summer School 2013, ICIAP 2013, GREC 2013, CAIP 2013, ACPR 2013, and CIARP 2013.

I hope you enjoy reading this edition of the *IAPR Newsletter,* professionally put together by the newly appointed Editor-in-Chief Arjan Kuijper and Layout Editor Linda O'Gorman. We also welcome Zeeshan Zia the new Associate Editor for Book Reviews. We take this opportunity to sincerely thank to Alexandra Branzan Albu for her excellent work over the past years as editor of the Newsletter.

From the ExCo, we extend to you our best wishes for a successful 2013!

In Memoriam

Maria Petrou, IAPR Fellow

17 May 1953-15 October 2012

by Josef Kittler, IAPR Fellow (UK)

It is with sadness that the IAPR Newsletter must report that shortly before ICPR 2012, Maria Petrou, IAPR Fellow and a leading authority on image processing, passed away.

In this article in the "Getting to Know...IAPR Fellows" series, Josef Kittler shares with us some of her many interests, achievements and awards.

~ A. Kuijper, ed.

Maria Petrou was born in Greece and educated at the University of Thessaloniki, where she graduated in Physics in 1975. For her outstanding performance she was awarded a studentship, giving her an opportunity to study abroad. The award brought her to the United Kingdom to study Mathematics Part III at Churchill College, Cambridge, which was followed by PhD studies in Astronomy. She gained a PhD degree from the University of Cambridge in 1981. After her PhD she returned to Greece to take up a post as Lecturer at the Department of Astronomy, University of Athens, but her longing for a fulfilling research career brought her back to the United Kingdom to take a Research Fellowship at St Hilda's College, Department of Theoretical Physics, Oxford in 1983.

She married a fellow PhD researcher with whom she had one son. With two astronomers in the family, Maria decided, in 1986, to switch her field of research from science to engineering and accepted a postdoctoral research position in image processing, first at Reading University, and subsequently at the Rutherford Appleton Laboratory.

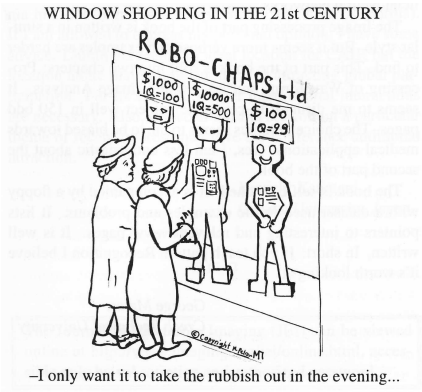
She joined the University of Surrey as a Lecturer in Image Analysis in 1988. She played a key role in the development of the Centre for Vision, Speech and Signal Processing, and deserves all the credit for its growth in the areas of Remote Sensing and Medical Imaging. In recognition of her outstanding research achievements, she was rapidly promoted to increasingly senior academic positions, culminating in Professor of Image Analysis in 1998. She enjoyed teaching as much as research. Her Wiley book on Image Processing: The fundamentals, originally published in 1999, was very popular, and was reprinted several times (see *IAPR Newsletter* review of the 2nd Edition).

In the scientific community, Maria is famous for her outstanding contributions to image analysis and its application, especially to remote sensing. She proposed a novel image representation for image matching known as trace transform. She developed advanced techniques for edge and line detection, for texture analysis and for image segmentation. She was a specialist in colour image processing and developed an award winning stereo-based 3D mensuration system for the stone industry. The number of citations to her work runs into thousands. For her outstanding contributions to Engineering, she obtained her DSc degree from Cambridge University in 2009.

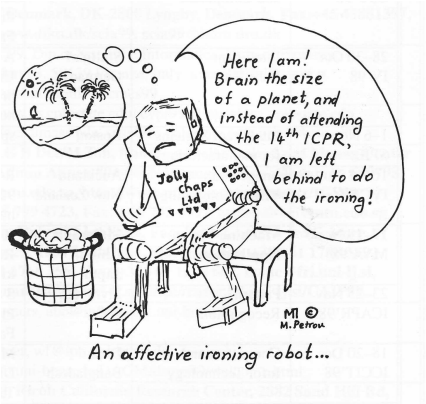
During her illustrious academic career she worked on challenging projects, such as the EPSRC Basic Research project "Reverse engineering the human vision system". Being a working mother, she had a

(Continued on page 19)

(Continued from page 18)



Cartoon from the April 1998 issue of the *IAPR Newsletter,* Maria Petrou, ed.



Cartoon from the July 1998 issue of the *IAPR Newsletter,* Maria Petrou, ed.

bee in her bonnet about domestic chores, and eventually succeeded in getting funding from the Cognitive Systems and Robotics Programme of the European Commission to develop an ironing robot. Ironing is a particularly challenging task from the Computer Vision point of view because cloths have complex shapes and difficult nonrigid surfaces for vision systems to understand.

She also contributed enthusiastically and tirelessly to the activities of professional societies in various capacities. She served as Chairman of the British Machine Vision Association during 1999-2002. She was on the editorial board of several scientific journals, including IEEE Transactions on Image Processing (1994-98). She was heavily involved in the organisation of many scientific conferences. In the IET, she served as an Honorary Editor of IET Electronics Letters, as an elected member of the Council of IET (2004-2007), as a Trustee of IET (2007-2009), and as a member of the Publications Board of IET (2006-2008). In the International Association for Pattern Recognition (IAPR) she held the post of Chairman of IAPR Technical Committee TC7: Remote Sensing (1998-2002), and that of IAPR Treasurer during 2002-2006.

In the period 1994-1998 she served as *IAPR Newsletter* Editor. She loved that job which gave her an opportunity to share her sense of humour with the IAPR community. She also enjoyed drawing cartoons, which lightened many issues of the IAPR Newsletter.

The external recognition of her academic achievements, and contributions to professional activities includes many accolades. She was elected Fellow of IET in 1998 and Fellow of IAPR in 2000. In 2004, she was elected Fellow of the Royal Academy of Engineering, and in 2006, she was awarded the title of Distinguished Fellow of BMVA. She received the ScD degree from Cambridge University in 2006.

Professor Petrou left the University of Surrey in 2005 to lead the Communications and Signal Processing Group at the Department of Electrical Engineering, Imperial College London. In 2009, she became the Director of the Informatics and Telematics Institute in the Centre for Research and Development, Hellas, in Thessaloniki, Greece.

Maria's outstanding achievements were the product of her scientific excellence and hard work as well as her enormous courage and determination. A Special Edition of Pattern Recognition Letters celebrating her life and work will be published in January 2014.

Maria's energy, devotion, professionalism, empathy and friendship marked the lives of many of us, and of her students, in an unforgettable way. It was pleasure to work with her and to benefit from her wisdom and generosity. It was privilege to know her. She will be sadly missed by her friends and colleagues in the international pattern recognition and image analysis community.

CALL FOR PAPERS

Special Edition of Pattern Recognition Letters: Celebrating the life and work of Maria Petrou

www.journals.elsevier.com/pattern-recognition-letters/call-for-papers/celebrating-the-life-and-work-of-maria-petrou/

Maria Petrou was an outstanding scientist with a well developed sense of humour, and seemingly tireless energy. She had the ability to enliven whatever she became involved in. Although she worked for most of her professional life in the UK, she was born and died in Thessaloniki, and was proud of her Greek roots and the language, culture and intellectual traditions of her country of birth. She trained as an astronomer, but moved into the fields of pattern recognition and image analysis. She took a leading role in the IAPR, and made many innovative research contributions, some of which are set to have a lasting impact. She was a woman and devoted mother, who worked in fields where women are in a minority and has provided a role model for younger women scientists and engineers to follow. Those who came into contact with her were invariably impressed both by her incisive thinking and warm personality. She enriched the scientific lives of over 50 PhD students and numerous collaborators from all over the world. Sadly, she passed away on October 15 2012 after a brave battle with cancer, and will be greatly missed.

The aim of this special edition of Pattern Recognition Letters is to celebrate Maria's life and work. The aim is to collect together both scientific articles and personal reflections which illuminate her contributions to our field. We encourage contributions from both those who worked with Maria, and those whose work was influenced by her.

Maria's interests were broad, spanning image processing and analysis, remote sensing, medical image analysis, computer vision and, of course, pattern recognition. She was noted for her key contributions the trace transform, mixed pixel classification (remote sensing community), Hough, contextual classification (multi resolution MRF), and edge/line detection.

We invite three different types of contribution:

a) Short recollections of Maria and reflections on her life and work, that capture her personality and interests. We are particularly keen to receive photographs to illustrate these accounts. We would hope to edit both the photographs and accounts together into a montage capturing the different facets of her life and work.

b) Reviews that place her work in the context of the literature in the field, focus on her scientific contributions and assess their lasting influence

c) Original scientific papers in the broad areas of Maria's research interests, pointing out their relevance to her work. These could be posthumous papers with Maria as co-author, submitted by one of her collaborators or students.

Although we want the special edition to reflect Maria's life and personal qualities, we expect that the bulk of papers in the Special Edition will be original scientific articles focused around her research interests.

Deadlines:

1. submission of papers for review – 1st June 2013 (submission open on http://ees.elsevier.com/prletters/ from 1st May 2013).
2. first reviews/decisions - 15th August 2013
3. revised papers – 1st October 2013
4. publication - 1st January 2014.

Josef Kittler and Edwin Hancock, Guest Editors.

INSIDE the IAPR
Editorial Staff Changes

Editor-in-Chief

Arjan Kuijper (Germany)
email: *arjan.kuijper@igd.fraunhofer.de*

A happy & productive new year! Since I had no clue how to start my introduction as the new Editor-in-Chief of the *IAPR newsletter*, I thought that this wish would be appropriate.

During 2012, many of you would have attended and presented papers or posters at one or more IAPR-supported meetings, which have been or will be reviewed in the *IAPR Newsletter*. This issue of the *Newsletter* is dedicated to the IAPR flagship conference, the International Conference on Pattern Recognition (ICPR). You can read more about ICPR 2012 (beginning on Page 8) and one of its satellite conferences, the Joint IAPR International Workshops on Structural and Syntactic Pattern Recognition and Statistical Techniques in Pattern Recognition (S+SSPR 2012). And don't forget to check the ICPR 2012 web site, as the photo album is online! So, read the reports and get inspired— read and review books!—and check the conference planner. :)

In this *Newsletter* you can find some of the "traditional" news items. What is new is that we have a new Associate Editor for Book Reviews, Zeeshan Zia. Also new is the EiC. I would like to thank Professor Alexandra Branzan Albu who held this position for the past four years. Just as she did, I will do my best to make the *IAPR Newsletter* a news and information platform for the IAPR community. I'm looking forward to collaborating with Layout Editor Linda O'Gorman and Zeeshan as well as with the IAPR ExCo to provide you with all kinds of relevant and interesting material.

The newsletter is not just our hobby (well, yes, it is fun, of course!): it is ***your*** source of information about the IAPR and its activities! So if there are things that you would like us to change, incorporate, or add, please let us know (arjan.kuijper@igd.fraunhofer.de)! We have some things in mind: just check the next issues and you'll notice it!

For those interested in who this new EiC actually is: check the October 2009 issue of the *Newsletter* and find my introduction as Associate Editor for Book Reviews. ;)

Editorial Staff Changes (continued)

Associate Editor for Book Reviews

Zeeshan Zia (Switzerland)
email: *mzia@ethz.ch*

Following the tradition of this newsletter, let me introduce myself briefly. I am a fourth year PhD candidate at the Swiss Federal Institute of Technology (ETH), Zurich, working on visual object recognition. Earlier, I pursued a Master's degree at the Technical University of Munich in Germany where I carried out research in 3D object class recognition, experimenting with untextured kitchen objects like cups, pans, glasses and bottles, etc. as well as on a scene understanding system for activity recognition by detecting and tracking simultaneously hands, objects, and background landmarks in 3D.

For my PhD, I am trying to develop object class models that output more fine-grained hypotheses than just 2D bounding boxes as are currently fashionable. I have been extending 3D deformable object modeling ideas from the very early days of computer vision (in collaboration with Konrad Schindler, Michael Stark, and Bernt Schiele) so that 3D object geometry and continuous pose hypotheses can be obtained in challenging monocular images. More recently, we have been making these models robust against relatively severe occlusions and are now attempting to use them as building blocks to reconstruct and understand complicated scenes from single images. I was also a Qualcomm fellow during 2012, and will be visiting their augmented reality research center in Vienna over the summer (2013) to do some real-time computer vision on mobile chipsets.

Why BooksBooksBooks?

While journal and conference papers usually have a better ideas-to-words ratio than books, books are still a great way to convey a longer strand of ideas or introduce a new field of study to readers that otherwise would not be possible in a limited number of pages. Besides, with the huge increase in research activity in the domains which are of interest to IAPR in the recent years, books have an important role in surveying research results and bringing forward the more successful techniques for students and practitioners. I myself am an avid reader of books on machine learning, computer vision, and pattern recognition, among other topics and have always gained from good reviews (including the ones from this newsletter) and have been interested in making my own impressions public to help fellow readers. I reviewed a book for the IAPR newsletter August 2012 issue, and another one that will appear in the April issue.

Thus I am happy to be facilitating with the book reviewing process for this valuable newsletter. I invite the readers to let me know whenever they would like any particular book to be reviewed, and also if they are interested in one of the titles we have available for review (*see Free Books on the Of Interest...page*).

BOOKSBOOKSBOOKS

Biodata Mining and Visualization
Novel Approaches

by Ilkka Havukkala
World Scientific, 2010

Reviewed by
Arjan Kuijper (Germany)

My motivation for reviewing this started 6 years ago. To be precise: on Tuesday, 22/08/06, between 10:30 and 12:30 in Hong Kong. At that time I was presenting our poster "Matching 2D Shapes Using their Symmetry Sets" (*www.computer.org/csdl/proceedings/icpr/2006/2521/02/252120179-abs.html*) at ICPR 2006. So this is also a story about why I actually love poster sessions!

The paper dealt with some mathematical aspects of shape matching, and I had some examples showing the results of shape matching on the Kimia data set. Especially, a set of tools and fishes got nice results, and because of that, Ilkka approached me saying that these were exactly the shapes he was interested in, basically because they were mostly elongated with some additional structures. He had similar shapes obtained from the internet that visualized microRNA structures and wanted to compare such shapes. Although I was a bit skeptical, we exchanged email addresses, and (lo and behold!) we had contact, exchanged data and it did work out well. We even published some papers together.

So, I love poster sessions! ☺

But let's get back to the book. When I learned that Ilkka had written a book, I was of course interested in it. While writing our papers, it was already clear that although our backgrounds intersected a bit, they didn't completely overlap. This book is a clear proof of that. BioInformatics is a booming research area, but the biggest problem is the different backgrounds, interests, and languages for computer scientists and biologists. For me, the microRNA was 'only' an application, while for Ilkka the matching was merely an 'algorithm'. Without the will to understand each other more deeply, fruitful collaboration is quite difficult.

This book tries to bridge this gap. For completeness, the topics covered start with an *Introduction to Modern Molecular Biology*, then discuss the *Biodata Explosion* before going into depth with the chapters that deal with discovery, comparison, searching, and classification: *Local Pattern Discovery and Comparison Genes and Proteins*, *Global Pattern Discovery and Comparison Genomes*, *Molecule Structure Based Searching and Comparison*, and *Function Annotation and Ontology Based Searching and Classification*.

Two chapters discuss novel methods that are starting to find their way into bioinformatics:

(Continued on page 24)

(Continued from page 23)

New Methods for Genomics Data: SVM and Others and *Integration of Multimodal Data: Toward Systems Biololy.* The book ends with the almost obligatory *Future Challenges*.

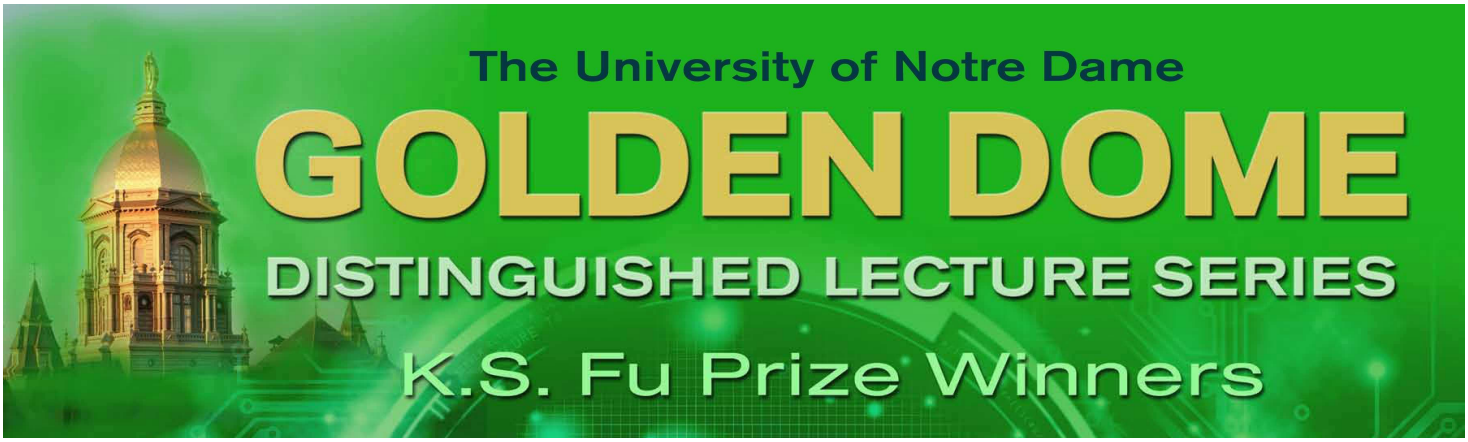
For biologists, it describes relevant pattern matching tools for finding relevant and/or related genomes and molecule structures. For PR people, it describes the used biological data – a huge jungle in which one easily gets lost. Nice, predefined ground truth data sets are most of the time not there, and formats differ. This makes 'simply applying known methods' almost impossible.

The chapters are meant as an introduction to the topic. Each of them contains a rich list of references for further reading. This makes the book a good source for those starting in biodata mining and analysis, but also for those willing to broaden their scope. Evidently, as the field is booming, the subtitle "novel approaches" may be outdated soon, but that is the inevitable problem with state of the art reports.

I found the book very interesting and complete. Perhaps is was a bit hard to read every now and then, but very useful as, for instance, here in Darmstadt we are also collaborating with biologists in Interactive Visual Comparison of Multiple Phylogenetic Trees (cf. Chapter 8) (*www.gris.informatik.tu-darmstadt.de/research/vissearch/projects/ViPhy/*) and massively-parallel (GPU) implementation of the computation of (co) evolutionary signals from biomolecular sequence alignments based on mutual information and a normalization procedure to neutral evolution (*www.gris.informatik.tu-darmstadt.de/projects/comic/*) (cf. Chapter 9).

For those interested, several chapters of the book can be downloaded from the web site of Worldscientific: *www.worldscientific.com/worldscibooks/10.1142/6709#t=toc*.

K. S. Fu Prize Lecture Series



Report prepared by

Kevin W. Bowyer, IAPR Fellow, and Horst Bunke, IAPR Fellow and recipient of the 2012 K. S. Fu Prize

As initially announced in the *IAPR Newsletter* of April 2012, the University of Notre Dame hosted a series of lectures during the Fall Semester 2012, given by recipients of the K. S. Fu Prize.

The lecture series started on September 10, 2012 with Prof. Theo Pavlidis, Distinguished Prof. Emeritus at the University of Stony Brooks, who gave a talk on Using Domain Knowledge for Low Level Vision. Based on his long experience in both academia and industry, one of the main messages given by Theo in his talk was that computer vision is an extremely hard task that can be solved only if we include all available prior information about the scenes we want to interpret.

The lecture series was continued with Prof. J. K. Aggarwal, Cullen Trust Endowed Professor at the University of Texas at Austin, who talked on Recognition of Facial Expressions for Improving Communications Skills of Children with Autism Spectrum Disorders. Jake explained how the latest research results in facial expression recognition and tracking can be utilized in an interactive game to improve emotion recognition capabilities of children with autism spectrum disorders.

The third lecture in the series was given by Prof. Thomas S. Huang, William Everitt Distinguished Professor at the University of Illinois in Urbana-Champaign. The lecture was entitled Human-Computer Intelligent Interaction and addressed a diversity of problems that need to be solved when developing novel human-computer interfaces. It was accompanied by live demonstrations given by Prof. Huang's PhD students Vuong Le and Zhen Li.

Next was the lecture Detecting and Distinguishing Nuances of Anomaly in Machine Perception Systems by Prof. Josef Kittler, Distinguished Professor at the University of Surrey, UK. Demonstrated mainly on the example of automatic sports video annotation and understanding, Josef showed ways to integrate methods of different nature so as to detect various nuances of anomalies in the input data of a complex pattern recognition and interpretation system.

The fifth lecture was given by Prof. Anil Jain, Distinguished Professor at Michigan State University. Anil talked on Large-Scale Data Clustering. He first

(Continued on page 26)

(Continued from page 25)

gave a general introduction and an overview of the field of clustering and then discussed novel algorithms that are able to handle large data sets, comprising hundreds of millions of objects.

Finally, Prof. Horst Bunke, Prof. Emeritus at the University of Bern and Melchor Visiting Professor at the University of Notre Dame, presented a lecture on Bridging the Gap between Structural and Statistical Pattern Recognition. This lecture gave a review of graph kernels and graph embedding methodology, which allow one to apply the whole arsenal of tools from statistical pattern recognition to symbolic data structures, and showed examples of successful applications of these concepts.

The lectures were well attended by students and faculty members of the University of Notre Dame. In addition they were broadcast live. Video streams and all slides accompanying the lecture have been archived and can be accessed via *www.cse.nd.edu/Fu_Prize_Seminars/*

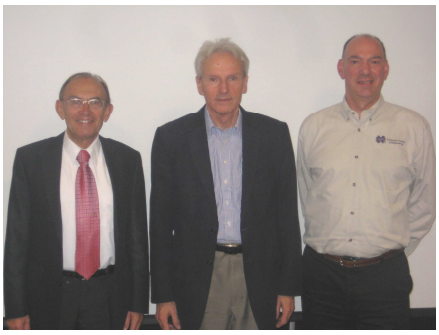
When the planning of the lecture series was started, the most recent winner of the K. S. Fu Prize was not yet announced. Meanwhile, the K. S. Fu Prize 2012 has been awarded to Prof. Rama Chellappa, Minta Martin Professor of Engineering and Director of the Center for Automation Research at the University of Maryland (*see related article in this issue*). We are glad to announce that Rama has been invited to continue this lecture series and has agreed to present his lecture in Spring 2013. Details about time and location of his talk will be announced in due time at the seminar series' web site.

Finally, we want to thank all speakers for accepting our invitation and making this lecture series a great success. Further thanks are due to the IAPR for announcing the lecture series on their web page and to the University of Notre Dame for financial support and for providing the technical infrastructure .

From left, Kevin Bowyer, Patrick Flynn, Theo Pavlidis and Horst Bunke

From left, KJ. K. Aggarwal and Horst Bunke

From left, Patrick Flynn, Kevin Bowyer, Thomas Huang and Horst Bunke



From left, Horst Bunke, Josef Kittler and Kevin Bowyer

From left, Patrick Flynn, Horst Bunke, Anil Jain and Kevin Bowyer

Workshop Report: S+SSPR 2012

Joint IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR 2012) and Statistical Techniques in Pattern Recognition (SPR 2012)

November 7-9, 2-12
Miyajima-Itsukushima, Hiroshima, Japan

Co-Organizers:

Atsushi Imiya, IAPR Fellow (Japan)
Mineichi Kudo, IAPR Fellow (Japan)
Georgy Gimel'farb (New Zealand)
Keiji Yamada (Japan)

Co-Program Chairs:

Arjan Kuijper (Germany)
Edwin Hancock, IAPR Fellow (UK)
Shinichiro Omachi (Japan)
Terry Windeatt (UK)

Report prepared by Atsushi Imiya (Japan)

The joint IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR 2012) and Statistical Techniques in Pattern Recognition (SPR 2012) were held at Miyajima-Itsukushima, Hiroshima, between 7th-9th November, 2012. These are respectively the 14th and 9th editions of the SSPR and SPR workshops. This joint event is biannually organized by Technical Committee 1 (Statistical Pattern Recognition Technique) and Technical Committee 2 (Structural and Syntactical Pattern Recognition) of the International Association of Pattern Recognition (IAPR), and held in conjunction with the International Conference on Pattern Recognition (ICPR).

In front of the conference hotel in the suburbs of the city of Hiroshima, we could see the Grand Gate (Otori) of Itsukushima shrine, which is listed as a UNESCO World Heritage Site.

As is now tradition, during the SPR workshop, the Pierre Devijver Award recipient presents an invited lecture. The 2012 award winner was Professor George Nagy from Rensselaer Polytechnic Institute in Troy, New York, USA. The workshop also contained invited talks by Kenichi Kanatani from Okayama University and Ales Leonardis from the University of Birmingham.

George Nagy, Pierre Devijver Award Lecture

"Estimation, Learning, and Adaptation: Systems that Improve with Use"

Abstract:
The accuracy of automated classification (labeling) of single patterns, especially printed, hand-printed, or handwritten characters, leveled off some time ago. Further gains in accuracy depend on classifying unordered sets or ordered sequences of patterns. Linguistic context, already widely used, relies on 1-D lexical and syntactic constraints in plain text. Style-constrained classification exploits the shape-similarity of sets of same-source (isogenous) characters of either the same or different classes. 2-D structural and relational constraints are necessary for understanding tables and forms. Applications of pattern recognition that do not exceed the limits of human sensory and cognitive systems can benefit from green interaction whereby operator corrections are incorporated into the classifier.

(Continued on page 28)

The topics of the SSPR Workshop were Structural Matching and Syntactic Method; Probabilistic and Stochastic Structural Models; Graphical Models and Graph-Based Models; Spectral Methods for Graph-Based Representations; Kernal Methods for Structured Data; Structural Learning in Spatial or Spatio-Temporal Signals; SSPR Methods in Text,

(Continued on page 28)

(Continued from page 27)

Document, Shape Image, Video and Multimedia Signal Analysis; Intelligent Sensing Systems; and Novel Applications.

The SPR Topics were Multiple Classifiers and Large Margin Classifiers; Density Estimation and Model Selection; Ensemble Methods, Bayesian Methods and Kernal Methods; Independent Component Analysis and Compressed Representation; Unsupervised and Semi-Supervised Learning; Linear and Non-linear Manifold Learning; Gaussian Processes; Dimensionality Reduction; Cluster Analysis; Data Visualization; Hybrid Methods; Comparative Studies; SPR Methods in Text, Document, Shape Image, Video and Multimedia Signal Analysis; and Novel Applications.

There were some 120 papers submitted to the joint workshops and 80 papers from 18 countries were accepted. We thank the members of the international program committee for their thoughtful reviews, which have led to the interesting and varied set of papers presented at the conference and published in the proceedings.

The main social event of the workshop was a visit to Itsukushima. At the island, participants enjoyed the twilight on the red shrine from the shore and lighted from west in the afternoon, like living in a movie with the Emperor (*Twilight in the Forbidden City* by Sir Reginald Fleming Johnston, *The Last Emperor* by Bernardo Bertolucci). They also learned the Japanese middle age theology as a combination Shinto and Buddhism.

In 2012, the joint SSPR and SPR Workshops were co-hosted by the pattern recognition research groups from four Japanese Universities, namely Hokkaido University, Tohoku University, Hiroshima University, and Chiba University. The Special Interest Group of Pattern Recognition and Media Understanding (SIG

(Continued from page 27)

Kenichi Kanatani

"Optimization Techniques for Geometric Estimation: Beyond Minimization"

Abstract:
We overview techniques for optimal geometric estimation from noisy observations for computer vision applications. We first describe estimation techniques based on minimization of given cost functions: least squares, maximum likelihood, which includes reprojection error minimization as a special case, and Sampson error minimization. We then formulate estimation techniques not based on minimization of any cost function: iterative reweight, renormalization, and hyper-renormalization. Showing numerical examples, we conclude that hyper-renormalization is robust to noise and currently is the best method.

Ales Leonardis

"Hierarchical Compositional Representations of Object Structure"

Abstract:
Visual categorisation has been an area of intensive research in the vision community for several decades. Ultimately, the goal is to efficiently detect and recognize an increasing number of object classes. The problem entangles three highly interconnected issues: the internal object representation, which should compactly capture the visual variability of objects and generalize well over

(Continued on page 29)


Photo by Arjan Kuijper

(Continued on page 29)

(Continued from page 28)

PRMU, formerly SIG PR) of the Institute of Electronic Information and Communication Engineers (IEICE) of Japan also gave formal support for this event. SIG PRMU(PR) is one of the oldest communities for pattern recognition in the world, dating back to 1960s. Interestingly, the origins of the Principal Component Analysis (PCA) technique now universally used in pattern recognition can be traced back to independent early work by Taizo Iijima (1963, at the former Electrotechnical Laboratory of MITI) and Satosi Watanabe (1962, from the University of Hawaii). Today PCA is an indispensable tool in pattern recognition that has recently been extended to give both sparse and kernel methods, providing powerful new tools for data reduction. In the 1970's basic methodology from structural and syntactical pattern recognition were used in a national project concerned with "Kanji" (Chinese Character used in Japanese context) character recognition and the results presented and discussed at a historically significant meeting of SIG PR.

We gratefully acknowledge financial support from the Institute of Media and Information Technology, Chiba University and from Chiba University. We also acknowledge valuable support from Hokkaido University, Tohoku University, Hiroshima University, and the Special Interest Group of Pattern Recognition and Media Understanding in Institute of Electronic Information and Communication Engineers of Japan.

The next S+SSPR will be organized by Professor Pasi Fränti of the University of Eastern Finland, Jouensuu, in the city of Joensuu, Finland, on August 20-24, 2014, one week before the 22nd ICPR at Stockholm.

Proceedings of the workshop have been published by Springer in the series Lecture Notes in Computer Science (Vol. 7626)

(Continued from page 28)

each class; a means for learning the representation from a set of input images with as little supervision as possible; and an effective inference algorithm that robustly matches the object representation against the image and scales favorably with the number of objects. In this talk I will present our approach which combines a learned compositional hierarchy, representing (2D) shapes of multiple object classes, and a coarse-to-fine matching scheme that exploits a taxonomy of objects to perform efficient object detection. Our framework for learning a hierarchical compositional shape vocabulary for representing multiple object classes takes simple contour fragments and learns their frequent spatial configurations. These are recursively combined into increasingly more complex and class-specific shape compositions, each exerting a high degree of shape variability. At the top-level of the vocabulary, the compositions represent the whole shapes of the objects. The vocabulary is learned layer after layer, by gradually increasing the size of the window of analysis and reducing the spatial resolution at which the shape configurations are learned. The lower layers are learned jointly on images of all classes, whereas the higher layers of the vocabulary are learned incrementally, by presenting the algorithm with one object class after another. However, in order for recognition systems to scale to a larger number of object categories, and achieve running times logarithmic in the number of classes, building visual class taxonomies becomes necessary. We propose an approach for speeding up recognition times of multi-class part-based object representations. The main idea is to construct a taxonomy of constellation models cascaded from coarse-to-fine resolution and use it in recognition with an efficient search strategy. The structure and the depth of the taxonomy is built automatically in a way that minimizes the number of expected computations during recognition by optimizing the cost-to-power ratio. The combination of the learned taxonomy with the compositional hierarchy of object shape achieves efficiency both with respect to the representation of the structure of objects and in terms of the number of modeled object classes. The experimental results show that the learned multi-class object representation achieves a detection performance comparable to the current state-of-the-art flat approaches with both faster inference and shorter training times.

Call for Book Chapters

Integrated Imaging and Vision Techniques for Industrial Inspection: Advances and Applications

Series: Advances in Computer Vision and Pattern Recognition
Springer

Integrated imaging- and vision-based techniques are of paramount importance for automated visual inspection in modern manufacturing and engineering. The sophistication of the techniques assures high-quality performance of the manufacturing process through precise positioning, online monitoring, and real-time classification. Advanced systems incorporating multiple imaging and/or vision modalities provide robust solutions to complex situations and problems in industrial applications. A diverse range of production/manufacturing industries, including aerospace, automotive, electronics, pharmaceutical, biomedical, semiconductor, steel production, and food/beverage, etc., have benefited from recent advances in technologies. This book is to highlight such advances and demonstrate the successful applications of integrated imaging and vision technologies in varied industrial inspection tasks.

The book consists of two parts: advances and applications. The advances provide an insight into recent progress, developments, and future trends of imaging and vision techniques for varied industrial inspection tasks, while the applications present the state-of-the-art of imaging and vision system integration, implementation, and optimization.

Potential topics are listed below. Contributions from academia and industry are welcome.

- Vision-based Network System
- 3D Scanning, optical 3D sensing
- High-speed inspection
- Computational methods
- Vision system beyond visible spectrum
- Hyperspectral imaging
- Thermoal imaging inspection
- Terahertz imaging inspection
- X-ray imaging inspection
- Consumer product packaging quality inspection
- Solar cell panel inspection
- Remote visual inspection
- Automotive applications
- Food and beverage quality
- Electronic component, integrated circuit, printed board, and flat panel inspection
- Smart camera in real-time industrial imaging

The book manuscript guidelines from publisher are available here: *www.springer.com/authors/book+authors?SGWID=0-154102-12-417900-0*

Please contact the editors to discuss about your contribution. The contribution should be ready/submitted in six months once the "consent to publish" agreement is signed.

Dr. Zheng Liu (email: *zheng.liu@ieee.org*)
Dr. Hiroyuki Ukida (email: *ukida@me.tokushima-u.ac.jp*)
Dr. Pradeep Ramuhalli (emal: *pradeep.ramuhalli@pnnl.gov*)
Professor Kurt Niel (email: *kurt.niel@fh-wels.at*)

Free Books!

The *IAPR Newsletter* is looking for reviewers for the books listed below.

If you have interest and some knowledge in the topic, email us with your mailing address. We will send you a copy of the book—which you may keep—and will expect in return a review for the *Newsletter*.

Zeeshan Zia, IAPR Newsletter *Associate Editor for Book Reviews*

The following titles are available to be reviewed:

Handbook of Iris Recognition by Mark J. Burge (ISBN 978-1-4471-4401-4): www.springer.com/computer/image+processing/book/978-1-4471-4401-4

Consumer Depth Cameras for Computer Vision by Andrea Fossati (ISBN 978-1-4471-4639-1): www.springer.com/computer/image+processing/book/978-1-4471-4639-1

3D Computer Vision, 2nd ed. by Christian Wöhler (ISBN 978-1-4471-4149-5): www.springer.com/computer/image+processing/book/978-1-4471-4149-5

More Free Books listed at the Springer web site

Meeting and Education Planner

*NOTE: This is not an exhaustive list of workshops, conferences, and summer schools. It is a list of meetings supported by IAPR plus additional meetings that have been brought to the attention of the editor (these non-IAPR meetings are denoted with an *). The IAPR web site has more up-to-date information about IAPR workshops, conferences and summer schools. Additional meetings that may be of interest to the IAPR Community can be found at USC's Institute for Robotics and Intelligent Systems list of Computer Vision Conferences.* *~ (A. Kuijper, ed.)*

Highlighting indicates that paper submission deadline has not yet passed.			
2013			
ICPRAT 2013 *	International Conference on Pattern Recognition Applications and Techniques *	Chennai, India	1-2 Mar 13
CCIW 2013	Fourth Computational Color Imaging Workshop	Chiba, Japan	4-5 Mar 13
DGCI 2013	17th IAPR International Conference on Discrete Geometry for Computer Imagery	Sevilla, Spain	20-22 Mar 13
IWBF 2013	International Workshop on Biometrics and Forensics	Lisbon,	4-5 Apr 13
PSL 2013	2nd International Workshop on Partially Supervised Learning	Nanjing, China	13-14 May 13
MCS 2013	11th International Conference on Multiple Classifier Systems	Nanjing, China	15-17 May 13
GbR 2013	9th IAPR TC-15 Workshop on Graph-based Representations in	Vienna, Austria	15-17 May 13
MVA 2013	13th IAPR International Conference on Machine Vision Applications	Kyoto, Japan	21-23 May 13
ISMM 2013	11th International Symposium on Mathematical Morphology	Uppsala,	27-29 May 13
ICB 2013	6th IEEE/IAPR International Conference on Biometrics	Madrid, Spain	4-7 Jun 13
Biometrics Summer	10th Summer School for Advanced Studies on Biometrics for Secure Authentication	Alghero, Italy	10-15 Jun 13
SCIA 2013	18th Scandinavian Conference on Image Analysis	Espoo, Finland	17-20 Jun 13
ICIAR 2013 *	International Conference on Image Analysis and Recognition*	Póvoa de	26-28 Jun 13
MLPRA 2013 *	4th International Workshop on Machine Learning, Pattern Recognition and Applications *	Helsinki, Finland	1-5 Jul 13
ICVSS 2013 *	International Computer Vision Summer School: Computer Vision and Machine Learning *	Sicily, Italy	14-20 Jul 13
GREC 2013	10th IAPR International Workshop on Graphics Recognition	Bethlehem,	21-21 Aug 13
ICDAR 2013	12th International Conference on Document Analysis and Recognition	Washington, DC, USA	25-28 Aug 13
CAIP 2013	15th International Conference on Computer Analysis of Images and Patterns	York, UK	27-29 Aug 13
ICIAP 2013	17th International Conference on Image Analysis and Processing	Naples, Italy	11-13 Sep 13
ACPR 2013	2nd IAPR Asian Conference on Pattern Recognition	Okinawa,	5-8 Nov 13
CIARP 2013	18th Iberoamerican Congress on Pattern Recognition	Havana, Cuba	20-23 Nov 13
2014			
ICPR 2014	22nd International Conference on Pattern Recognition	Stockholm,	24-28 Aug 14
ICFHR 2014	14th International Conference on Frontiers in Handwriting Recognition	Crete, Greece	2014