BMVA News

The Newsletter of the British Machine Vision Association and Society for Pattern Recognition

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BMVA News[1] is published every three months. Contributions on any activity related to machine vision or pattern recognition are eagerly sought. These could include reports on technical activities such as conferences, workshops or other meetings. Items of timely or topical interest are also particularly welcome; these might include details of funding initiatives, programmatic reports from ongoing projects and standards activities. Items for the next edition should reach the editor by 17th April 1998.

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Editorial

You may have read last year about the report carried out on two US medical journals. Apparently there was some discrepancy in the number of articles included from developing countries. Both journals contained few such articles, but one included an order of magnitude less. The debate is whether this merely reflects the lower quality of submitted articles from developing countries, or if instead discrimination is taking place.

In this light I thought it might be interesting to carry out a little survey of my own, and selected two computer vision journals: *IEEE Transaction on Pattern Analysis and Machine Intelligence* and *Pattern Recognition Letters*. Now, since I didn't actually have time to leaf through a large stack of backissues I've used some rough and ready approximations. Scanning the last three years of the SCI database I counted the number of affiliations from each country. Therefore I didn't correctly distinguish between papers from single or multiple institutions.

The counts are shown in the table below, and certainly show substantial differences. Look at the change in representation from India for instance! Having said that, what are the reasons? After all, since PAMI is an American journal they may have a general US bias. And also, being the more prestigious journal with a higher standard might also have an effect. I'm afraid I can't untangle all these confusing possibilities, so I'm going to leave you to make up your own minds. If anyone sorts it all out please let me know...

PAMI		PRL	
503	USA	139	USA
63	Canada	90	Taiwan
45	Japan	74	India
45	Israel	63	France
33	Italy	62	Italy
33	England	45	England
31	France	37	Canada
20	Germany	34	Singapore
19	Australia	33	Hong Kong
16	South Korea	30	Japan
14	Taiwan	28	Spain
14	Netherlands	28	Australia
11	Hong Kong	27	South Korea
10	Switzerland	26	Germany
9	Belgium	25	Netherlands
6	Korea	20	Israel
6	India	20	Finland
5	Scotland	12	Singapore
5	Norway	8	Sweden
4	Turkey	7	Korea

Remote Sensing Meeting

A one-day BMVA Technical Meeting on AI Methods and Data Fusion in Remote Sensing was held on 21st January 1998 at the British Institute of Radiology in London. Its goal was to bring together AI specialists and their remote sensing counterparts. The meeting attracted a number of scientists and research students in both fields and total number of participants was probably between twenty and thirty. It was chaired by Dr Maria Petrou (University of Surrey).

The day started with presentation by Paul Ducksbury (DERA) titled Feature Selection using Genetic Algorithms for Detector and Parameter Selection where he showed some interesting examples, particularly on detection of linear features in remotely-sensed imagery. Unfortunately the technical side of the talk was difficult for me as a remote sensing student with geographical background; however, the presenter and the organisers provided a list of references for all interested after the meeting. Then the morning session was continued by George Simpson, who spoke on multiscale fusion of EO data, meteorological and contextual information for ice classification and compilation of ice charts; by Graham Herries, who described the advantages of multiply neural networks versus single ones; and it was concluded by Maria Petrou, who gave a talk on fuzzy reasoning with a GIS.

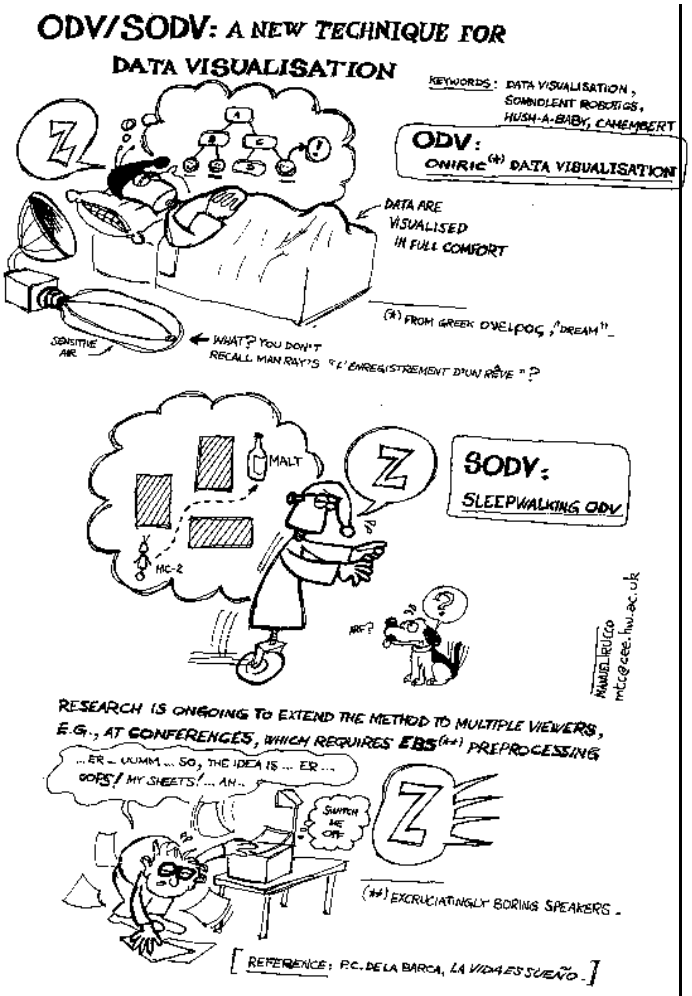
Lunch gave a good opportunity for informal discussions. The afternoon started with a presentation by Martin Brown, who reported on the current progress of FLIERS project. Ambitiously aimed at increasing land cover classification accuracy to more than 85%, at the first stage the project concentrated on validation of input remotely-sensed data. It was surprising to hear that up to 8% of repeated radiance values were found in a test TM scene, mainly resulting from geocorrection. The next talk, given by Edwin Hancock, was concerned with terrain surface analysis and modelling, particularly using adaptive meshes.

After coffee it was followed by a talk on a statistical active contour model for SAR image segmentation, or snake (Matt Horritt), and the day was finished by Pexin Hous talking about on image segmentation for on-board region-based JPEG-type image compression for microsatellites. On the whole I felt that the meeting was very useful and friendly organised. It will be great if we have more such meetings where there is a chance to meet specialists from a similar field but with a very different approach to the problem. Perhaps it could be also combined with short (e.g. half-day) tutorials on particular topics.

Olga Toutoubalina
Scott Polar Research Institute
University of Cambridge

Data Visualisation

The Data Visualisation technical meeting took place at the British Institute of Radiology on 15th March 1997. A broad range of topics was covered and discussed at the meeting, ranging from the basic introduction of data visualisation to the current state-of-the-art of the technology. Speakers were



drawn from the academic, government and commercial sectors.

Helen Wright from the University of Leeds gave an overview of data visualisation systems and explained the dataflow paradigm which they used. She also showed video clips of the facilities for manipulating and visualising 2D and 3D data using the IRIS Explorer.

John Mariani from Lancaster University discussed the pivotal role of visualisation in Computer Supported Collaborative Work (CSCW). He described two graphical representations (Q-space and SISCO-D) of the shared space and of the user's presence and activity within that space.

Mike Tipping from Aston University talked about a hierarchical visualisation algorithm which allows complex data sets in high-dimensional space to be visualised at the top level, with clusters and subclusters of data points visualised at deeper levels. Their algorithm is based on a hierarchical mixture of probabilistic principle component models, and the combined model parameters are determined using the Expectation-Maximisation algorithm. Its performance was demonstrated using both synthetic and real examples.

Andrew Webb from the Defence Evaluation and Research Agency talked about various techniques that produced 2-dimensional representations through non-linear transformation of the data for visualisation. He reviewed some of the standard statistical techniques as well as generalisations of these techniques using neural networks.

Bob Hendley from the University of Birmingham described their work that addressed the problems in developing visualisation tools to help users gain insight into and intuition about their ill-defined complex systems and behavioural patterns. The tools that were developed are used to represent the system being modelled as objects in a 3-dimensional space. These objects have behaviours attached to them which affect the physical representation of the objects. This leads to a meaningful structure emerging from the interactions between individual objects. The visualisation sits as an agent within an agent architecture. This enables agents to communicate conveniently and, for instance, to change the parameters that are used to generate the visual representation.

Sue Haines from the Defence Evaluation and Research Agency discussed the different types of visualisation required for analysts and domain experts. She pointed out that for analysts there exists a rich variety of visualisation techniques which can be used to search and explore n-dimensional data spaces. While on the other hand for the domain experts the methods which can be used are very much more constrained. It remains a challenge to provide a connection between the two representations of 'data set'; one for the analyst while the other for the domain expert.

Byran Williams from IBM UK Laboratories talked about their regional forecasting system that was used successfully at the Atlanta Olympics in 1996. It was a collaborative project between IBM (Data Explorer), US National Weather Service (NWS), the Forecast Systems Laboratory (FSL), the National Centre for Environment Prediction (NCEP), and Colarado State University. In the past Olympics weather forecasting provided predictions with low resolution, and was performed daily. The requirements for the Atlanta Olympics were that accurate local predictions should be made for 2 and 8 kilometre square areas, and 6-12 hours forecasts should be produced for each of the four Atlanta venues ev-

ery 3 or 6 hours. Since the forecast produced large amounts of data it was necessary to use visualisation techniques to analyses the results. The developed weather forecast system was shown to be a robust solution which required very little local control and the system was subsequently automated.

Julian Gallop from Rutherford Appleton Laboratory talked about the recent progress in scientific visualisation especially the use of virtual reality. He also talked about the computer assisted co-operative techniques to allow dispersed groups to collaborate in projects that involve visualisation.

Finally, Margaret Varga from the Defence Evaluation and Research Agency talked about the Nato Research Study Group 30 – Network-of-Experts on Visualising Massive Military-Relevant Datasets. The aim of this initiative is to create an informal forum for researchers to exchange information, data and expertise on visualisation. The second Nato Network-of-Experts on Visualisation workshop took place on 14/15th May at the DERA (Malvern). More details regarding this workshop can be obtained from Margaret Varga.

Proceedings of the above technical meeting can also be obtained from:

Dr. Margaret Varga
Defence Evaluation and Research Agency,
St. Andrew's Road,
Malvern, WR14 3PS.
tel: 01684-895712
fax: 01684-894952
email: `varga@signal.dra.hmg.gb`

Complementary Journals

IOS Press is offering BMVA members complementary copies of the 'Journal of Visualization' and the 'Journal of Integrated Computer-Aided Engineering'. The scope of JV is visualization techniques, image processing, computer aided visualization and computer graphics. JICAE covers innovative computer-aided engineering (CAE). It will also publish novel industrial applications of CAE. Other areas covered by the journal include biologically inspired computing, cognitive modelling, concurrent engineering, data engineering, distributed computing, fuzzy systems, genetic algorithms, intelligent and adaptive systems, knowledge engineering, machine learning, mechatronics, neurocomputing, object-oriented systems, parallel processing, symbolic processing and virtual reality.

For more information including reduced subscriptions contact

IOS Press
Van Diemenstraat 94
1013 CN Amsterdam
Holland
email: `sales@iospress.nl`
URL: `http://www.iospress.nl`

Applied Vision Association

APPLIED VISION ASSOCIATION

The Applied Vision Association (AVA) is an organisation of vision scientists formed in 1977 and enjoying charitable status since 1995. The aim of the AVA is to promote and advance the study and knowledge of all areas related to human vision including medical problems. Although the association's name implies a focus on applied aspects of vision, equal emphasis is placed on the importance of basic research. To meet these broad objectives, scientific meetings are arranged to appeal to all disciplines and interests relating to vision including physics, engineering, computer science, psychology and ophthalmic optics.

The AVA's calender starts with the AGM, usually around early April, and which in previous years has been a two or three day meeting. However, the current emphasis is towards shorter one-day meetings where registration fees have typically been kept to no more than £20. Meeting programmes usually include two or three key-note speakers, a dozen submitted papers and a similar number of posters with an attendance of 60 or so delegates. Abstracts are refereed and usually published in an archived academic journal. While these meetings attract scientific presentations of the highest standard, they are characterised by a relaxed atmosphere, allowing students and junior scientists to freely exchange ideas and experiences with more senior colleagues. Recent meetings include one on 'Depth Perception' in Guilford, and the Second AVA Christmas Meeting on 'The Visual Brain', held at Aston University. Future plans include a meeting on 'Natural Images', the Third AVA Christmas Meeting and an AVA Postgraduate

Meeting, to be held on Feb 11th at the College of Optometrists (address below).

The committee, which currently numbers eight in strength (including two co-opted members) are elected to post at the AGM and meet regularly throughout the year.

The AVA aims to appeal to established Vision Scientists both within and outside of academia, as well as postgraduate students. For example, an award is made each year (recently increased to £400) on a competitive basis from the association's Geoffrey Burton Memorial Fund to help finance the presentation of a student's research at an international conference.

Annual membership of the AVA presently costs £16.00 (or £8.00 for students) and application forms can be obtained from the address below. Members receive the AVA's bimonthly Bulletin, which keeps members abreast of forthcoming meetings and events, both social and scientific, as well as containing meeting reports, product reviews and a useful list of selected references on vision. Members are also entitled to a 20% reduction in registration fees at meetings and are offered competitive prices on a range of text books.

AVA Secretariat
The College of Optometrists
42 Craven St
London WC2N 5NG
`http://www.dmu.ac.uk/ava/`

EPSRC Update

IMV Conference

On 21/22 July 1997, a conference was held at the University of Surrey, to disseminate and monitor progress on the projects funded under the Integrated Machine Vision (IMV) programme. The event was attended by nearly 90 academics and industrialists. Presentations were given on all IMV projects, including the Image Understanding Environment (IUE) activity co-ordinated by Manchester University.

Keynote addresses were provided by Professor Bernard Buxton, UCL, and Dr John Chan, Electronic Automation Ltd, on behalf of David Humphries, then UKIVA Chairman. Professor Buxton highlighted the potential of the integration of computer vision, graphics and virtual reality in soft, lifestyle applications such as enhanced reality for TV and advertising, entertainment and games, communications, electronic commerce and training. Dr Chan emphasised the importance of appropriate dialogue with industry to ensure exploitation of machine vision research.

At the close of the conference, Professor Mike Brady, Oxford University, gave a summary of the monitoring panels impression of the IMV projects. He said that the pervasiveness of computer vision technology was reflected in the way the projects spanned a much wider range of application areas than would have been apparent five years ago. It was noted that the industrial partners on a number of the projects had stated that they were already taking steps to exploit research results. Professor Brady commended the IMV projects for undertaking some first class engineering research and establishing good interactions with industry.

Interaction with UKIVA

In August 1997, I gave a talk to the UKIVA on EPSRC-funded machine vision research and academic-industrial interaction. The UKIVA is keen to be kept up to date on relevant EPSRC activities. Individually, a number of members also expressed an interest in improving their own interactions with universities, particularly through CASE studentships.

Funding in 1997

During 1997, Systems Architectures (SA) funded £2.1M of machine vision research in the responsive mode, representing 32% of the SA budget committed in that year. A further £1.3M of applications related vision research was funded through other EPSRC Programme Areas. You may also be aware that two of the four Faraday Partnerships awarded in 1997 to develop effective networks between academia and industry, particularly SMEs, are relevant to machine vision. These are:

Intelligent Sensors for Control Technologies (INTErSECT) – Sira/NPL INTErSECT will initiate new research and ways of disseminating information on intelligent sensing and measurement systems, particularly to meet industrial requirements for analysis, control and monitoring of manufacturing processes using non-invasive methods.

3D-MATIC: 3D Multimedia Applications and Technology Integration Centre – University of Glasgow/Turing Institute The 3D-Matic Partnership will enable small and medium sized enterprises to gain access to advanced 3D digitisation technology and 3D applications. Potential applications are varied including engineering, computer aided design, automobiles, design studies for clothes, the film and TV industry and companies specialising in automation and games software.

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Treasurer's Report

Reviewing the BMVA accounts for the last financial year, January – December 1996, shows that the Association income and expenditures were largely in line with the previous year. A small profit of about £90 was made. The major items of expenditure continue to be associated with the one-day technical meetings and the regular mailshots. Overall, the Association finances are very healthy with good reserves in the bank.

The credit card payment facility is now available for use in payment of meeting fees or for items such as copies of the BMVC proceedings.

Anyone requiring further information of the accounts should contact the Association Treasurer, Dr Margaret Varga.

Margaret Varga
Treasurer
Defence Evaluation and Research Agency
Malvern
email: varga@signal.dra.hmg.gb

Venue for BMVC 1999

Following on from the success of the last British Machine Vision Conference, chaired by Adrian Clark and held at the University of Essex, plans are well advanced for staging the BMVC98 event, which will be chaired by Mark Nixon and held at University of Southampton (14-17 September). However, the executive committee has already begun considering potential venues for BMVC 1999.

It has been a policy of the committee to attempt to locate the conference in a varied range of locations, whilst maintaining a geographic distribution which has so far been roughly balanced between Southern and Northern sites. Over the last five years, the BMVC has been held at Essex, Edinburgh, Leeds, Glasgow and Oxford. Traditionally the event has been hosted by Academic Institutions containing sizeable groups of vision and vision related research groups, in order to ensure that man power support for the conference organisation is available.

This article has been written to invite applications from potential sites for BMVC 1999. Whilst the executive committee has striven to maintain the geographic diversity of conference sites, we have yet to see a BMVC in Wales or Northern Ireland. The possibility also exists for staging future events at locations which have already hosted past BMVCs. If you would wish to be considered as a potential venue for BMVC99, then I would urge you to contact myself or one of the other members of the executive committee for consideration at the next meeting of the committee in mid March.

Tim Ellis
BMVA Chairman
City University
email: t.j.ellis@city.ac.uk

SIRS98

6th International Symposium on Intelligent Robotic Systems '98

Edinburgh, Scotland, UK, 21-23, July 1998

The aim of the event is to cover all modern approaches to robotics problems. It will provide invited lectures by established personalities, original presentations by junior scientists about research in progress, and discussions in particular on (but not limited to) the following topics:

- Mobile Robotics
- Active Perception
- 3D Reconstruction
- Learning and Control

- Cooperation
- Control Architectures
- Robotic Applications
- Planning and Plan Execution
- Fuzzy and Neural Control
- Miniature Robotics

All information related to SIRS'98 is available at: `http://www.dai.ed.ac.uk/SIRS98/` Detailed information regarding programme, conference fee, accommodation and social events will appear in the SIRS'98 web site at the appropriate time. Questions can be put by email to: `sirs98@dai.ed.ac.uk`. General enquiries to

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Department of Artificial Intelligence
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5 Forrest Hill
Edinburgh EH1 2QL
tel +44-131-650-3094

RSS98

24th Annual Conference and Exhibition of the Remote Sensing Society

The University of Greenwich, Chatham Maritime, Kent, UK. 9 - 11th September 1998

Theme: Developing International Connections

The aim of RSS98 is to bring together scientists, commercial users and potential new users of remote sensing technology from both the UK and overseas to foster greater international co-operation between the RSS and the world-wide remote sensing community. There will be a variety of plenary and poster sessions covering the following subject areas:

- Remote sensing for environmental management in Developing Nations
- Commercial remote sensing Agriculture
- RADAR Global environmental monitoring
- Software / Image Processing Archaeology
- Mapping Meteorology and climatology
- International collaboration in remote sensing Oceanography
- Airborne Sensors Geology
- Integration with GIS Forestry / Ecology
- RS Education Urban mapping
- Graduate/Postgraduate projects Natural Hazards
- Hyperspectral image analysis Water resource management

For further information, see
`http://www.gre.ac.uk/~rss98`
or email `rss98@gre.ac.uk`

Neural Networks and Statistics

As you may be aware from our published technical meeting timetable, we are shortly due to hold a meeting on Neural Networks and Statistics in Machine Vision towards the end of May.

It has long been my personal belief that a potentially fruitful way forward for the development of advanced vision systems, and if you like the solution of the Machine Vision 'problem', is via the construction of learning systems. The most appropriate paradigm for this work is clearly artificial neural networks, though I fully understand any scepticism that visions of Multi-Layered Perceptrons naively trained on a vast image dataset engender in the hardened vision researcher.

In order to break away from this mould what is needed is new statistical methods which allow the automatic generation of flexible network architectures. I have therefore suggested this meeting in the hope that it will bring together like-minded individuals with experience in the use of neural networks in vision and the development of statistical methods for the generation of adaptive systems.

Just to complicate things a little we have decided to attempt to run this meeting at Birmingham as an alternative to the London venue. Perhaps this may make it easier for those of you, who like me have to travel from the far reaches of the country to get to technical meetings. Whether this new arrangement continues in the future will depend upon the success of initial meetings.

If after reading all of this you feel you might like to present recent work at this meeting please contact me.

Neil Thacker
University of Manchester
Department Medical Biophysics
email: `nat@sv1.smb.man.ac.uk`
tel: 0161 7255118

Underwater Image Processing

A colloquium on "Underwater Applications of Image Processing" has been organised by IEE Professional Group E4 (Image Processing and Vision) and will be held at IEE, Savoy Place, London WC2R 0BL on Wednesday, 25 March 1998. The Colloquium will cover a wide range of relevant topics including:

- The through water channel characteristics
- Underwater camera systems
- Object recognition techniques
- Autonomous underwater vehicles
- Sonar array processing
- Signal processing for data transmission
- Correction and enhancement techniques in image processing
- Optical and laser techniques
- Experience with practical systems

Signal and Image Processing

IEE Professional Group E4 (Image Processing and Vision) will be running a Colloquium on "Non-Linear Signal and Image Processing" which will be co-sponsored by PG E5 (Signal Processing). It will be held at IEE, Savoy Place, London WC2R 0BL on Friday 22 May 1998 and will be organised by Professors Roy Davies and Alan Holt (E4) and Mr. Andy Fraser (E5).

The purpose of the meeting will be to air and discuss issues, methods and the latest non-linear signal and image processing techniques for such applications as non-destructive testing, geophysics, remote sensing and ground probing radar. In these areas, non-linear operations are able to achieve things which linear operations cannot – not least, elimination of interference in all its forms. In acoustics, elimination of cracks, pops, scratches and echoes is important, while in imagery, salt and pepper noise, blur and irrelevant detail all have to be removed or suppressed, often in special ways, with the aim of initiating segmentation or performing pre-processing prior to recognition operations. Indeed, non-linear processing includes the whole of the topical area of morphological operations. This colloquium will cover a range of applications of non-linear filters as well as current developments in the theory of non-linear filtering.

Prospective authors should submit an extended abstract (1000 words) describing their contribution by 28 February 1998 to:

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Royal Holloway
University of London
Egham, Surrey TW20 0EX
tel: +44 (0)1784 443497
fax: +44 (0)1784 472794
email: E.R.Davies@rhbnc.ac.uk

BMVA Technical Meetings

18 March 1998 "Image and signal based analysis of pigmented skin lesions" at the BIR, organiser: Ela Claridge (School of Computer Science, The University of Birmingham, Birmingham B15 2TT; tel: 0121 414 4778; fax: 0121 414 4281; email: E.Claridge@cs.bham.ac.uk)

8 April 1998 "People and animal watching", at the BIR, organisers: Tim Cootes and Chris Taylor

6-7 July 1998 "Medical Image Understanding and Analysis '98", University of Leeds organisers: Liz Berry, D.C. Hogg, K.V. Mardia and M. A. Smith (University of Leeds), sponsored by BMVA, BIR, IEE, IPEM, RAE

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