

BMVA News

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

Volume 10 Number 4
May 2000

Editor: Dr Paul Rosin
Department of Computer Science
Cardiff University
Cardiff, CF24 3XF
Tel: +44(0)29 2087 5585
Fax: +44(0)29 2087 4598
Email: Paul.Rosin@cs.cf.ac.uk

<http://www.bmva.ac.uk/>

BMVA News¹ 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 31st July 2000.

Contents

Extracts from the Minutes	1
EPSRC Theme Day	2
Vision in Man, Monkey and Machine	3
ACCV2000	4
SPIE Meeting	4
EPSRC Vacation School in Computer Vision ...	5

¹The British Machine Vision Association and Society for Pattern Recognition is a Company limited by guarantee, No. 2543446, registered in England and Wales. Registered Office: Granta Lodge, 71 Graham Road, Malvern, WR14 2JS. The Association is a non-profit-making body and is registered as charity No. 1002307.

Editorial

One often hears complaints about the turgid quality of technical prose: long rambling, laboured sentences, packed to the brim with jargon, etc. I'm sure we can all think of some examples – and I'd be pleased to hear of some of your “favourites”. Of course, in computer vision we at least have the benefit of diagrams and images to help us wade through the dense writing and equations – without that it could be much worse.

Some of this impenetrable prose may be attributed to the divide between “neat” versus “scruffy” practitioners that I remember reading about in some AI magazine from the 1970's. It was suggested that there are two camps of researchers: the neat who favour the formal, mathematical approach to problem solving, and the scruffy who prefer a looser, heuristic style. Naturally, members of each camp find the other camp's work unacceptable, or at any rate hard to digest.

But strangely enough, it seems that overall we like our papers that way! A study was carried out (in one of the physical sciences) in which a batch of published papers were rewritten by technical writers to improve readability. The better prose was confirmed by people outside the field. However, this conflicted with the opinion of researchers from the discipline. It seems that they had become so used to the style of prose that its various circumlocutions and jargon had become an essential shorthand that they had difficulty in understanding the content without them. I'm sure there must be a moral to be learnt somewhere in all that!

Extracts from the Minutes

In this issue we start a column in which extracts of the BMVA Executive Committee Meeting minutes are included. The aim is to give BMVA members a better idea of the workings of the committee as well as to provide information on ongoing issues currently under discussion or implementation by the committee – Editor.

Electronic Resources

It was observed that books are used less often than CVOnline by some students. Dr. Clark suggested a web based journal, which would be peer reviewed and in which both code and data would be made available. Prof. Kittler suggested 'Benchmarking in Computer Vision'. There was a discussion about whether such a journal could work – would it be rated highly enough for people to prefer to send papers to it rather than established paper journals? Dr. Gilby suggested putting in a grant application for setting up a repository of data etc required. Prof. Petrou suggested asking EPSRC to make it a condition of grants that data be made open source on the completion of the grant. This might be difficult to police and introduce barriers to commercial exploitation (IPR issues). It was suggested that BMVC could have a theme, in which test sets of images are provided for different groups to use (ICPR2000 is trying this).

Fellowship Proposal

Prof. Davies presented a revised proposal for a fellowship scheme for the BMVA to honour significant contributions to computer vision, which was well received. Modifications suggested by the committee:

- Recipient should be a UK based person
- No cash prize – some elegant ornament or such instead
- A suitably esteemed sub-committee should be set up (3 people, rolling membership)
- A timetable should be devised: submissions by June, decision for BMVC

The first sub-committee will consist of Prof. Davies, Dr. Ellis and Dr. C.C.Taylor.

General Publicity

Through Dr. Mirmehdi a set of BMVA publicity leaflets have now been produced (5000 in total) by a designer at Bristol.

ICPR2004

A bid for hosting ICPR2004 is being made up. London and Cambridge were considered as the only possible locations attractive to overseas visitors. London was very expensive and so Cambridge is the only alternative.

Block Bookings

It was decided that if more than 10 students on an MSc course joined in a block, a 30% discount would be offered. It's worth joining the BMVA early on in the course in order to get the newsletter, and free access to all meetings.

Standing Orders

Prof. Taylor ran through a new set of Standing Orders that were designed to be short, readable, and straightforward. These were accepted after minor amendments. Eventually they would be put on the web.

Sponsorship Rules

A modified version of the IAPR rules will be used.

- Category A – collaborating organisations such as IEE, RSS, AVA, make no payment.
- Category B – co-sponsored meetings: £100 fee if there are less than 50 participants, otherwise a £200 fee. A single A4 page mailshot will be included.
- Category C – underwriting of meetings – financial details will be needed before agreeing.

Some rules need to be included about the use of the BMVA name.

EPSRC

Engineering and Physical Sciences Research Council

The EPSRC is running a “Theme Day in Machine Vision and Image Processing” on Wednesday 7th June, 2000 at The Institute of Civil Engineers, 1 Great George Street, London, SW1P 3AA.

It will cover all aspects relating to the generation, processing, communication, understanding and presentation of visual information, including image processing, machine vision, pattern recognition and computer graphics and their scientific and engineering applications, funded by the EPSRC. Posters detailing EPSRC funded work will be presented by invited grantholders.

Invited Speakers include:

- Dr Paul Anandan, Microsoft, USA
- Dr Ian MacIntyre, CSIRO, Australia
- Prof. Mike Brady, University of Oxford

For more details, contact Dr Jim Fleming (01793 444428, j.fleming@epsrc.ac.uk) or Mrs Carol Becker (01793 444 023, carol.becker@epsrc.ac.uk).

Vision in Man, Monkey and Machine

by M. J. Tarr and H. H. Bulthoff

MIT Press; ISBN: 0262700700

“**V**ision in Man, Machine and Monkey” is a 200 page edited work introducing the psychophysical and neurophysical explanations of human object recognition. The book opens with an excellent introductory chapter, written by the editors, which sets out the field, the problems and the history of understanding human object recognition – how do humans recognise three-dimensional shapes based on 2D retinal projections? The strengths of viewpoint-dependent theories are espoused here, with an introduction to Recognition By Components (RBC) schemes.

The ensuing chapters are actually papers reprinted from *Cognition: International Journal of Cognitive*

Science, and begin with *Recognition from multiple views* – how several views of an object can be efficiently combined to provide robust object recognition. *3D shape recovery from binary images* examines the extraction of volumetric shape from binarized images of simple scenes.

While it is understood that viewpoint-dependent mechanisms can easily explain human recognition performance when discriminating between exemplar members of a class, the chapter *Class invariance of viewpoint dependent mechanisms* asks how they fair with non-exemplars? The most biological chapter is *Cell responses to faces*, studying temporal-cortex cell recordings after presentation of a face or body stimulus. The results lead to an explanation of the observed phenomenon underlying some viewpoint-dependent recognition theories.

The next chapter, *Diagnostic recognition*, is a new framework attempting to bring together object recognition (“Is this a car?”) and categorization (“Is this object a member of the ‘car’ category?”) which are, essentially, complementary research areas. Finally, *Objects of action and perception* is a co-analysis of the fields of research of ‘vision as world perception’ (“reconstructive” approach) and ‘vision as action guidance’ (“purposive-animate-behaviourist” approach), showing that they are actually complementary theories, and not mutually opposing as the Marrians and Gibsonians believe.

Overall I enjoyed reading this book – despite being a special issue of a respected journal it still feels accessible to non-experts in object recognition, like myself. The chapters are well written and up to date with only a few typos slipping through, its illustrations are clear and useful, and I found my lack of neurobiological knowledge didn’t hinder my progress through the book. My only aesthetic gripe would be that the book is formatted much like a journal – small text with narrow line spacing – which does not really lend itself to casual reading. Since this is a book and not a journal, I felt this style of presentation was unnecessary.

One theme that emerges from the book is an emphasis toward viewpoint-dependent theories of recognition. Mention is made of RBC theories (notably Biederman’s geons) but those theories seem easily dismissed by the authors. This is not at all surprising, considering Tarr and Bulthoff are renowned advocates of viewpoint-dependent theories, but a little less bias would be warmly received by a sit-on-the-fence reader like myself.

Another theme is that, despite the title, there is little

in the way of machine or monkey vision. Both are alluded to occasionally in the chapters, but the computer vision researcher may be disappointed by the lack of algorithms or mathematical analogies with observed human vision processes. This in itself is not a bad thing, provided the book title was changed to reflect the content.

In summary then, coupled with a good reference book on human vision (I'm currently enjoying *Sensation and Perception* by Coren, Ward & Enns, Harcourt Brace College Publishers), this would make a good first buy for a newcomer to the field, or an up-to-date foundation text for a more experienced researcher.

Stuart Gilson
 Visual and Computational Neuroscience
 Research Group
 Dept. of Optometry and Neuroscience
 UMIST
 s.j.gilson@umist.ac.uk

ACCV2000

The Fourth Asian Conference on Computer Vision (ACCV2000) was held at the Grand Hotel in Taipei City, Taiwan during 8–11 January 2000. The theme of this conference was “Computer Vision in the New Century” and aimed to provide researchers and experts working at frontier of the computer vision theory and applications a forum to interact and exchange technical. The conference lasted for three days and had parallel sessions including 3 plenary talks; 6 invited sessions 100 research papers presented orally and 78 research papers were presented in two poster sessions. Authors from 23 countries were present.

ACCV2000 was opened by Dr. C. Y. Chang (Chiao Tung University, Taiwan) with a very welcoming opening speech. Promptly follow the speech was the first plenary talk that was given by Prof. M. Sakauchi, titled “Construction of Multimedia Mediation Mechanism”. This talk introduced and discussed a new framework for multimedia information applications and services developments.

The second plenary lecture was given by Prof. T Kanade on the topic of “Real Time Vision – Interaction among Algorithms, Hardware and Control”. In this talk Prof. Kanade discussed the issues that concerned the design and implementation of a real-time

vision system regard to latency, bandwidth, reliability, etc. These issues were discussed and illustrated by using an ongoing research project of a vision-based autonomous helicopter.

The final plenary talk, “Variational methods in Computer Vision from Theory to Application”, was given by Dr. O. Faugeras. The lecture discussed the use of variational methods in computer vision developments. Dr. Faugeras has shown that variational methods can be extremely useful for successful computer vision algorithms and systems developments. The presentation consisted of numerous examples to illustrate both the theoretical and practical strengths of such methods in the context of computer vision developments.

My presentation was on the use of an n-tuple classifier for automatic initiation of a model fitting algorithm. This is used to enable automatic estimation of salmon bio-mass underwater from stereo video images. The paper was very well received and in conversations afterwards people showed considerable interest in the research work on which it was based. I exchanged contact details with two people who specifically expressed a wish to make further contact with the research team.

I consider that my attendance at the conference was both successful and useful. The materials that were presented in the conference were of very high standard, and have broadened my view and knowledge of research and development in the field of computer vision. In addition the salmon bio-mass research project gained new international exposure within the image analysis community. I hope this may benefit both the project and the research group.

I would like to thank the British Machine Vision Association who contributed to my conference fee and the Douglas Bomford Trust who contributed to my travelling costs.

Dickson Chan
 dickson.chan@yahoo.com

SPIE Meeting

SPIE's Photonics West meeting was held between the 22nd and 28th of January at the San Jose Convention Centre in California. As well as a trade exhibition, it boasted four symposia concentrating on biomedical optics, lasers, integrated optoelectronic devices, and electronic imaging. Throughout

the week it offered tutorials, workshops, and specialised meetings, one of which was “Communicating with Computers: How Long Can the Keyboard and Mouse Survive? What Comes Next?”.

I decided to avoid that particular meeting in favour of a more sobering lecture by J. S. Payne of Buckinghamshire Chilterns University College. Presenting results from tests with human subjects, she demonstrated that we disagree about the similarity of many of the textures in the Brodatz collection. If we ourselves interpret the images in different ways, how can a computer be trained efficiently with this data? This talk came in the Image Analysis and Perception session, which also showed us some examples of “Inversion Processes in the Human Visual System”, reverspective pictures which cause an optical illusion by reversing the real depth of the image.

Photonics West was indeed a vast event, including many of the new and varied fields within optics. My particular conference was Document Recognition and Retrieval, one of the 27 conferences in the Electronic Imaging symposium. There was a healthy amount of research into OCR for different languages, as well as data extraction from forms, archiving and retrieval of digital documents, segmentation, and compression. I was particularly interested in Chen and Ho’s “Evaluation of Decision Forests on Text Categorization”, which suggested fast pruning of a web search by repeatedly grouping the retrieved documents into categories for selection or rejection.

There was a large commercial presence at the exhibition, demonstrating the latest available and prototype optical equipment, such as a camera so fast it could see a beam of light pass. We also heard about the development of Nichia’s laser diodes to emit wavelengths between 380 and 450 nanometers, and Picometrix’s transmitters and receivers for terahertz radiation (780-850nm). Of more direct application was the “Bronx Box”, a device being developed to efficiently identify the presence of a tuberculosis bacteria in a small saliva sample. Funded by the US National Institute of Health, this research hopes to create portable systems for use in the monitoring of tuberculosis in the Third World.

The conference was a good opportunity for me to gain experience from other researchers and communicate on an international platform. The poster and snack sessions had an amiable atmosphere and I shared ideas with academics doing similar and differing work to my own. A fellow European researcher and I agreed that one of the talks seemed to be more of an advert for a product than a communication of research. It was a perspective-reversing experi-

ence being at the heart of Silicon Valley, a high-flying community built upon the computer trade and industry. What remains as an image alongside it however, are the poor and destitute of San Jose who slept on the bus which took me to my hotel each evening. It struck me as a shame that few of those people would ever see or use the results of the inspiring work I was interacting with all day.

Paul Clark
University of Bristol
pclark@compsci.bristol.ac.uk

EPSRC Vacation School

This year the EPSRC Vacation School in Computer Vision will be running at the University of Surrey again, from Monday 19–Friday 23 June 2000. An outline of the topics covered is:

Topic	Lecturer
Image Formation	Tim Ellis
Student Posters	Maria Petrou
Low-Level Image Processing	Maria Petrou
Decision making in Vision	Josef Kittler
Image Modelling	Bernard Buxton
Neural Networks	Terry Windeatt
Fuzzy Logic	Maria Petrou
Theory vs ad hoc	Maria Petrou
Performance Characterisation	Neil Thacker
Software Tools	Adrian Clark
Lab Tour	John Illingworth
Photogrammetry and Vision	Stuart Robson
Multiple View Geometry	Andrew Fitzgibbon
Active Vision	Ian Reid
Lab using Matlab	George Matas
Papers and Publishing	John Illingworth
Biological Vision	Mark Bradshaw
From the Lab to Real Life	Patrick Courtney