

BMVA News

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

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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 28 February 2003.

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Editorial: *Changing Times, Changing Scenarios*

At the turn of the year it is time to look back and examine the state of things. To me it seems that the sands of time march to different tunes as the years go by. To put work differences down to fashion is to trivialise changes that have been necessitated by fundamental advances in technology and understanding. Many years ago fair numbers of us were obsessed with fast hardware—the reason being plain to see, for if our algorithms were ever to see the light of day, they would have to run on dedicated hardware, and to a large extent this had to be an end in itself. Nowadays, when one's desk PC can run quite complex algorithms in real time, the emphasis can properly be on the algorithms themselves—so much so that few details of hardware architectures now end up in BMVC papers.

Then there are things like invariants, which seemed to be in vogue a decade ago, and then got pushed aside as other topics became more interesting, relevant and important. The phenomenon is probably much like building motorways: once one bottleneck is eliminated, another automatically appears, but this doesn't mean that the original one was irrelevant—far from it. (And in any case, work on invariants didn't die out!)

Another facet of reality in the 1990s was the ‘neural networks with everything’ syndrome: but by now the focus in vision has very much moved on, perhaps because of the substantial training requirements of neural networks, and of course the need to guarantee success: well, you can never have absolute guarantees of success, but at least it’s possible to build reliable knowledge into conventional algorithms, and this is crucially important in 3-D interpretation for example.

Decades ago, Marr and others promoted biological views of vision: these theories were exciting and bold, but latterly were probably held up because insufficient was known about the human visual system. As I used to put it in my lectures “If you try to build a vision system making use of what is known about human vision, you could be tying it down to the chance vagaries of biological evolution, which may be irrelevant or even misleading when it comes to building a machine”. Soon, however, all this may need to be forgotten, as time has marched steadfastly on: note that it’s now a good 20 years since Marr’s book was published. Indeed, a case in point is the renewed interest in reverse engineering the human vision system, or parts of it—see the 29 January meeting advertised on p. 3 of this Issue.

The prospects are indeed exciting, as 20 years is a long time in neurophysiology, and many new things have been discovered. Apart from the recent developments in areas such as independent component analysis, which have been shown to have particular relevance to the processing carried out in region V1 of the cortex, there are new technologies such as MRI and blood oxygen level dependence (BOLD) imaging of the workings of the brain, which show where activity is actually taking place while vision is occurring. Clearly, if robust measured information and well-founded theories are available—reaching far further than the complex and hypercomplex cells of old (Hubel and Wiesel, 1965)—then we vision workers would do well to take them seriously. They will surely be having a substantial effect on the machine vision systems of the future (on a 5–10 year timescale) even if this year’s and next year’s commercial factory inspection systems aren’t able to benefit. It seems that we all live in interesting times (though following the well-known Chinese curse, the downside is that we have to run as fast as we can to stay in the game!).

Professor Roy Davies
 Editor, BMVA News
 email: e.r.davies@rhul.ac.uk

Image Analysis in Cellular Bioscience

One-day BMVA Symposium to be held at The Royal Statistical Society, 12 Errol Street, London, on 30 April 2003.

Chairs:

Patrick Courtney (Perkin Elmer Life Science)
 Jim Graham (University of Manchester).

Studying the function and dysfunction of the cell is at the centre of modern medicine, life science research, the pharmaceutical/biotechnology industry and, more recently, agriculture. The interaction of cells, cellular components, genes, proteins, and other related molecules is an immensely data-rich undertaking, especially with the availability of genetic information.

Since the invention of the microscope, images have had a central role in the study of the cell. Current analytical methods, such as microarray systems and 2-D gel electrophoresis are also essentially image-based techniques. However tools to analyse this body of data have often lagged other application domains such as bioinformatics or computer vision more generally.

Scientists and biologists working to understand the functioning of cells have access to a range of imaging tools to examine the cell in its various states. These may be used in conjunction with various dyes and fluorescent proteins which highlight active structure or events and offer new opportunities as well as new problems.

The meeting will highlight recent work in the area of automated cytology, cell image analysis, analysis of 2-D electrophoresis gels and related fields. We are seeking papers that report on recent work in the area from the perspective of technology and/or application.

Relevant topics include:

- cell and subcellular tracking
- multispectral and 3-D cell image analysis
- deformable models of cells
- cell segmentation and classification
- machine learning techniques applied to cell images
- artifact detection and rejection
- control of focus and automation
- cell assay screening systems
- cell sorting
- use of fluorescent proteins, GFP, FISH in image analysis
- 2-D gel analysis

gene and protein screening systems/microarrays
 human user interfaces
 higher dimensional data visualisation and exploration
 integration with external datasets
 software architectures
 performance evaluation.

This list is illustrative, and is not intended to be exhaustive. However, please note the day is about image analysis, so we would exclude papers on optics or the physics of image formation. We would also exclude image analysis of ‘macroscopic’ medical images (radiology, etc) as there are established forums where such work can be presented.

Submission date: 28 February. Please submit an extended summary of about one page A4 (no more than two pages, PDF preferred), including links or pointers to web-based illustrations, demonstration material or papers giving more details.

Please submit papers by email attachment (1 MB max please!) to Patrick Courtney by 17.00 on Friday 28 February 2003.

Patrick Courtney
 Perkin Elmer Life Science
 email: patrick.courtney@perkinelmer.com

Did you see the recent announcement from the OST?

Highlights include:

- increased allocations to all the Research Councils
- £30m training package to provide PhD students with business skills
- extra money for:
 - stem cell research (£40m)
 - genomics/proteomics (£136m)
 - neuroscience (£15m)
 - the changing role of the rural economy (£20m)
 - alternative energy sources (£28m)
 - e-science (£115m)
 - machine vision and other leading-edge technologies (£60m).

The full document can be downloaded at:

<http://www.ost.gov.uk/research/funding/budget03-06/sciencebudget091202.htm/>.

Maybe this is of interest to our readers?²

Dr Richard Harvey
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Reverse Engineering: the Human Vision System

Biologically inspired Computer Vision Approaches
 BMVA MEETING Royal Statistical Society, 12 Errol Street, London, 29 January 2003
 Chairman: Professor Maria Petrou.

AGENDA/PROGRAMME

10.00–10.30 Registration and Coffee

Roberta Piroddi and Maria Petrou (University of Surrey) “Working With Irregularly Sampled Data”
 Sumitha Balasuriya (University of Glasgow) “Image Sampling using a Self-organised Space-variant Retina”

Zhaoping Li (University College) “Pre-attentive Segmentation and Saliency Map in the Human Visual System”

Aaron Sloman (University of Birmingham) “Human Vision—a Multi-layered Multi-functional system”

Masud Husain (Imperial College) “Attention and Inattention during Visual Search”

Chris Atherton (University of Central Lancashire) “The Computation of Viewpoint-invariant and Viewpoint-dependent Object Recognition”

Bob Fisher and Yaoru Sun (University of Edinburgh) “Hierarchical Selectivity for Object-based Visual Attention”

Vijay Laxmi and R I Damper (University of Southampton) “Biologically Inspired Motion Detection and Classification: Human Machine Perception”
 Lewis Griffin (Kings College, London) “Feature Classes in Spatial Vision”

Anil Bharath (Imperial College, London) “Wavelets in Biological Vision”.

Professor Maria Petrou
 University of Surrey
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²Timely, relevant and even life-saving, I would say!—Ed.



BMVA

First International Conference on Vision, Video and Graphics

10–11 July 2003, University of Bath

FIRST ANNOUNCEMENT AND CALL FOR PAPERS

We invite research papers for the Vision, Video and Graphics Conference—VVG 2003. The intersection of computer graphics and computer vision promises many new application areas and raises new fundamental questions. This conference is a response to this developing area, and its purpose is to promote co-operation between the graphic and vision communities. The conference will be a high-quality single stream event, comprising keynote talks, peer reviewed podium presentations and posters.

Papers will be peer reviewed and published in an ISBN proceedings. A selection of the best papers will be put forward for a special issue of Graphical Models (formerly Graphical Models and Image Processing) (www.elsevier.com/inca/publications/store/6/2/2/8/3/9/).

EPSRC (<http://www.epsrc.ac.uk/>) are likely to provide bursaries to help UK PhD students attend. Following the success of related EPSRC events, we expect this conference to be well attended. The event is in association with the British Machine Vision Association and the Eurographics Association. The Eurographics Association (<http://www.eg.org/>) will publish the proceedings.

The conference will be held at the University of Bath (<http://www.bath.ac.uk/comp-sci/>). Bath is a World Heritage City, an architectural gem set in the beautiful west of England. It is easy to reach by all forms of transport, with excellent road and rail links to airports.

Invited Speakers

Steve Feiner, Columbia University, New York
Steve Seitz, Washington State University
Markus Gross, ETH, Zurich.

Organising Committee

Peter Hall, University of Bath
Andrew Calway, University of Bristol
John Robinson, York University
Min Chen, University of Swansea
Roger Hubbard, University of Manchester
Emanuele Trucco, Heriot-Watt University
Philip Willis, University of Bath
Edwin Hancock, York University
Adrian Hilton, University of Surrey
John Patterson, University of Glasgow
David Marshall, University of Cardiff
Marcus Magnor, Max-Planck-Institut f. Informatik.

Submissions

We invite full-length submissions of original papers (8-page limit) related to the following themes:

- Image based rendering (view synthesis from other images)
- Models from images and video, for graphics and visualisation applications
- Augmented reality
- Video augmented environments
- Content based retrieval (images and video)
- Photographs, paintings, and drawings
- Vision for scientific visualisation
- Images, videos, and volumes
- Analysis of dynamic scenes
- Hybrid model and image based methods
- Graphics models for vision applications
- Novel and interesting applications.

Local conference web page:

<http://www.cs.bath.ac.uk/vvg/>

Please submit electronic copies to vvg@cs.bath.ac.uk by 7 March 2003, using PDF format. Paper copies can be sent to Peter Hall, Department of Computer Science, University of Bath, Bath, BA2 7AY, UK. The conference language is English. To facilitate anonymous review, please include your contact details on a separate sheet.

Mailing list

If you wish to be placed on the mailing list for this conference, please register your interest with the IMA by email, and sending the following information: name and title, address, telephone number, fax number and email address. The relevant contact details are:

Conference Officer, The Institute of Mathematics and its Applications, Catherine Richards House, 16 Nelson Street, Southend-on-Sea, Essex, SS1 1EF; tel: (01702) 354020; fax: (01702) 354111; email: conferences@ima.org.uk; web: <http://www.ima.org.uk/>.

Dr Peter Hall
University of Bath
email: pmh@cs.bath.ac.uk

International Conference on Visual Information Engineering (VIE 2003)

7–9 July 2003, University of Surrey, Guildford, UK

VIE 2003 is the first in a new series of conferences addressing the field of Visual Information Engineering, bringing together researchers, developers, creators, educators, and practitioners in image processing, machine vision, computer graphics and visual communications to share their latest achievements and explore future directions and synergies in these exciting areas.

The main topics of the conference include, but are not limited to:

Visual Communication
Image Interpretation
Image and Video Analysis
Storage, Retrieval and Multimedia
Graphics
Architectures and implementation
Applications.

In addition to traditional research papers, the committee also welcomed³ submissions covering practical systems, commercial solutions and business topics related to visual information engineering, presenting well evaluated applications and studies

³The final submission date was 20 December, but a good many BMVA readers will doubtless be referees for this conference, so it seems worth publishing these details here.—Ed.

which clearly show thorough understanding of the underlying principles.

For more information on the conference and the topic areas, please link to:

<http://conferences.iee.org/VIE2003/>.

Further information is available from the VIE 2003 Secretariat, Institution of Electrical Engineers, Michael Faraday House, Six Hills Way, Stevenage, Herts, SG1 2AY; tel: +44 (0)1438 765655; fax: +44 (0)1438 765659; email: vie2003@iee.org.uk

The Institution of Electrical Engineers is registered in the UK as a charity.

Dr Farzin Deravi
University of Kent
email: f.deravi@ukc.ac.uk

IPOT 2003**CALL FOR DEMONSTRATION!**

Every year, the Image Processing and Optical Technology (IPOT) exhibition takes place in the National Exhibition Centre in Birmingham. In recent years, it has run concurrently with the Machine Vision Exhibition, and the next event will be on 12–13 February 2003. This exhibition brings together manufacturers and potential users of image processing and vision systems.

BMVA supports this event and all our members receive a ticket for free entry distributed with the December issue of the Newsletter. BMVA also has a stand at IPOT and the opportunity is given to our members to demonstrate their work there. BMVA covers the travel expenses for participation in IPOT, as well as some modest expenses for transporting equipment there if necessary.

Up to four demos will be accepted, which will run for at least half a day each. If you are interested in showing your work at IPOT 2003, please contact me to register your interest.

Note the following websites:

BMVA: <http://www.bmva.ac.uk/>
IPOT: <http://www.ipot.com/>

Dr Majid Mirmehdi
BMVA Publicity Officer
University of Bristol
email: m.mirmehdi@cs.bris.ac.uk



A view of Norwich, where BMVC 2003 will be held.

BMVC 2003 and CIVR 2003

BMVC 2003 will be held in Norwich from 9 to 11 September with a tutorial programme on 8 September. The current submission deadline is 18 April—make sure this date is in your diary and please check the website, <http://www.sys.uea.ac.uk/bmvc2003/>, for updates and further news.

CIVR 2003

Last year the International Conference on Image and Video Retrieval was held in London on 18 and 19 July. The conference was attended by around ninety delegates. There were keynote addresses from Arnold Smeulders and Alex Hauptman. The proceedings are available in the Springer-Verlag Lecture Notes in Computer Science series (<http://link.springer.de/link/service/series/0558/tocs/t2383.htm/> contains a list of contents).

The conference made a profit which will be distributed among the sponsors of which one was the BMVA.

Next year's conference will be hosted by the Beckman institute in Illinois in July. The website is at:

<http://skynet.liacs.nl/civr2003/>.

The submission date is 24 Feb 2003.

Dr Richard Harvey
University of East Anglia
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Document and Text Recognition in Images and Video Sequences

Call for Speakers for a new one-day BMVA Technical Meeting.

Date: Wednesday, 21 May 2003.

Chairs: Stephen Pollard (HP research Labs) and Majid Mirmehdi (Bristol University).

Prospective speakers should submit an abstract or contact either stp@hplb.hpl.hp.com or majid@cs.bris.ac.uk for further details.

Dr Majid Mirmehdi
University of Bristol
email: m.mirmehdi@cs.bris.ac.uk

Information on Meetings

For up-to-date information on forthcoming BMVA meetings, events and news, subscribe to the BMVA mailing list at:

<http://www.jiscmail.ac.uk/lists/bmva.html/>.

This is a moderated list: you will only receive official BMVA postings.

Dr Richard Bowden
University of Surrey
email: r.bowden@surrey.ac.uk

Special Announcements

BMVA Distinguished Prize 2003

The BMVA Executive Committee seeks nominations for the Distinguished Fellow 2003 award. This prestigious award is given to one person only each year in recognition to his/her services to the British Machine Vision community. The nominees must be distinguished researchers, based in the UK, who have contributed significantly to the field of research and the reputation of the British Machine Vision Community both nationally and internationally. Nominations, with a few lines of rationale, should be sent to Dr Tim Cootes (t.cootes@man.ac.uk), by the end of April 2003.

The Sullivan Doctoral Thesis Prize 2003

The BMVA Executive Committee seeks nominations for the Sullivan Doctoral thesis prize. The 2003 prize will be awarded to the best nominated thesis which was submitted and examined during the calendar year 2002. Thesis examiners and supervisors may act as nominators, but the committee would like to receive an accompanying report and endorsement of the nomination from the thesis external examiner.

Please send any nominations to the Secretary of the Association, Dr Dave Marshall (Dave.Marshall@cs.cf.ac.uk) by the end of April 2003. The theses nominated should be made available through a web page. In addition, two hard copies (not necessarily bound) should be sent to Dr David Marshall, Department of Computer Science, Cardiff University, Queen's Buildings, Newport Road, Cardiff, CF24 3XF.

Maria Petrou has stepped down from the Chair of BMVA after three years of service. On behalf of the Committee I would like to thank her for all her work and her dedication to the post. She worked hard behind the scenes to help the community and to ensure the BMVA ran its affairs efficiently and smoothly. As her successor I am indebted to her efforts to ensure that the many aspects of the BMVA's activities are well defined and documented. I wish her every success in her current sabbatical year.

Professor Tim Cootes
Chairman, BMVA Committee
email: t.cootes@man.ac.uk

Urgent Conference Deadlines

4th International Conference on Audio and Video Based Biometric Person Authentication

Guildford, United Kingdom, 9–11 June 2003

<http://avbpa2003.ee.surrey.ac.uk>
avbpa@eim.surrey.ac.uk

Submission deadline: 10 January 2003⁴

The interest in security and in using multi-modal biometric signal processing for security applications has been increasing over the last decade. The growth of Internet and mobile telephony has been an important factor in this respect. An important element of security is automatic authentication of persons. AVBPA will bring together the leading biometric signal analysis researchers and practitioners, concerned with image and voice modalities, to promote the development of robust solutions to efficient and secure communication. The conference is an official event of the International Association for Pattern Recognition (IAPR–TC14).

Dr Kieron Messer
University of Surrey
email: k.messer@eim.surrey.ac.uk

Biologically-inspired Machine Vision, Theory and Application

An AISB'03 symposium
Computer Science Department, University of Wales, Aberystwyth, 7–11 April 2003

<http://users.aber.ac.uk/fml/BIMVTA03/index.html>

Submission deadline: 8 January 2003⁴

Background of the Symposium

This call for extended abstracts is for one of five symposia offered by the Society for the Study of Artificial Intelligence and Simulation of Behaviour (AISB) under the theme of:

“Cognition in Machines and Animals”.

All the symposia will take place at the AISB'03 convention, to be held at the University of Wales, Aberystwyth, 7–11 April 2003, in parallel and serial sessions.

⁴Note that these deadlines will have passed by the time this issue is published. Here I am in some difficulty, but on the whole it seems better to inform readers who can then check for themselves whether the deadline has been extended: in my experience this happens in nearly 50% of cases.—Ed.

Scope of the Symposium

Computer vision has developed into a mature science over the last 40 years, but current computer vision systems are vastly different from, and in most cases lack the efficiency of, biological vision systems. Biological vision therefore remains a strong metaphor for the design of machines that simulate intelligent behaviour in visually sensed environments. Immensely rewarding applications in human-machine interaction await advances in the multi-disciplinary threads of machine vision, perception and cognition.

Dr Fred Labrosse
University of Wales, Aberystwyth
email: ffl@aber.ac.uk

Book Review Corner

Book Review

P. Soille *Morphological Image Analysis: Principles and Applications*. Springer-Verlag, Berlin, 1999, ISBN 3-540-65671-5, hardback

This is a scholarly tour de force through the world of morphological image analysis, and, as its title indicates, it covers both the basic theory and the applications of the subject. At xii + 316 pages, it is pretty comprehensive, and is probably as much as most readers will want to cover unless they have specialist applications in mind. After the Introduction, the chapters range over “Background Notions”, “Erosion and Dilation”, “Opening and Closing”, “Hit-or-Miss and Skeletons” (no surprises so far), “Geodesic Transformations”, “Geodesic Metrics”, “Filtering”, “Segmentation”, “Classification”, and “Application Fields”. Generally, these chapter titles are to be expected, and it is the depth of detail and the quality of writing that needs to be considered here.

At this point I have raced ahead too fast, and I ought first to recap to say what morphological image analysis is about. One doesn't need to be knowledgeable about ancient Greek to realise that morphology is the study of shape, and as such is at the core of image analysis. In fact, morphology grew up—into a serious systematic discipline for the study of shape—in the 1970s and 1980, and mathematical (mostly set) analysis was the key to making the study systematic—so much so that in various quarters the subject became known as

‘mathematical morphology’. In the early days, it soon became clear that objects could be filtered for size and shape by the simple expedient of performing sequences of shrinking and expanding operations: a shrink (or ‘erosion’) made the objects smaller, and thus small objects would be eliminated altogether, while a subsequent expansion (or ‘dilation’) would re-expand the surviving objects to something like their original size and shape. Thus objects could be sorted (and hence sieved, filtered or classified), and certainly if these processes were carried out in sequence at different scales, with different amounts of shrinking and expansion, there was great power in such sorting mechanisms. The mathematics was needed to predict how effective such sequences of operations would be: it also permitted systematic analysis of the possibilities when the dilation and erosion operations were permitted to be directional as well as isotropic.

The next generalisation was to include conditional operations within the sequences of operations, thereby allowing functions such as thinning to be carried out. However, the flowering of morphology was largely due to its generalisation of the whole area of shape analysis, including directional shifts as mere special cases, and going on to include geodesic measurement (of distances within and outside objects—a concept that is useful for optimal path location), and the whole subject area was generalised to cover grey-scale as well as binary images. Progressing to grey-scale images led to possibilities for providing useful segmentation operations, using processes such as the ‘watershed’ transformation. It should be noted that grey-scale edge detection is possible using morphological methods (e.g. subtract the eroded from the dilated image), thereby providing useful alternatives to the usual intensity gradient (convolution) operators. Indeed, convolution has its own correlates in morphology, though the mathematics now becomes highly nonlinear: this is perhaps why the processing elements are called ‘structuring elements’ in morphology, to be sure of distinguishing them from the ‘kernels’ of convolutions.

It ought perhaps to be said that morphology has the power to encompass image noise suppression, and in this context, median and rank-order filters are to be regarded as morphological operators, in principle being within the same overall mathematical framework. However, the ordering concept they employ is rather special, and I am less than convinced that rank-order filters fit easily within the framework, but rather tend to be interesting cases of their own: such a view is in line with the contents of

Pierre Soille's book.

All these concepts are well covered in this volume, with copious, very clear illustrations showing a myriad of images containing objects, textures and structures in both unprocessed and processed forms. Amongst the illustrations are also many useful diagrams, histograms, mappings and other mental aids. The subject is intricate and no stones are left unturned in explaining carefully what is meant, and relating the work to everyday experience. The author is clearly master of both the subject and its teaching, and it is good that he has managed to capture his didactic capability into an elegant volume such as this. Perusal of the Preface indicates that the work is aimed at engineers, scientists and practitioners, and the word 'textbook' didn't appear anywhere that I could find. Thus there were no problems at the end of chapters, and no worked examples: instead I found well over 300 references distributed over the various chapters, and scholarly references to them both generally within the text and particularly in the 'Bibliographical notes and references' to be found at the end of each chapter.

This volume will definitely be useful for all workers who are in the process of studying both shape (the original concept of morphology) and intensity patterns (the more current interpretation of the subject). If I have any problems with the text, these stem from the nature of the subject which (as portrayed here) contains vast amounts of intricate detail: having the mathematics dispersed around all this detail made my own study somewhat more difficult. I found I couldn't see the wood sufficiently for all the trees. While I am confident that studying the book over a long enough period would eliminate the problem, my own view is that presenting a good body of the mathematics in a more concentrated manner (cf. certain parts of the 100-page chapter in the Haralick and Shapiro book, 1992) would help the reader to get to grips with the subject better: get to the wood first, then gain familiarity with the individual trees. In any case, many readers need the wood rather than the trees, as they merely want to know what it is they are missing out on!

Another thing I found lacking was any depth on automated inspection types of application, and guidance on how to choose systematically amongst the large available set of morphological operators. It should be noted that genetic algorithms have been used for the latter purpose, but this only gets a single minor mention. Going back to applications, the whole book contains applications in the sense of the great many interesting illustrations, and this

is capped by the final "Application Fields" chapter. However, the latter is little over 12 pages long and really provides only overviews, while the focus in the rest of the book is mostly on illustration of morphological algorithms rather than on the applications themselves.

Finally, the volume ends with an excellent index, which makes the work especially useful for the practitioner. Overall—in spite of my limited criticisms above, which to some extent show my own inclinations on this particular subject matter—I recommend this book unreservedly as the best one I have encountered on this particular topic, and feel it will go a long way in the future. My final sorrow is that I received this book for review only a couple of weeks ago, well after its original publication, but I immediately felt that I should do what I could to bring it to other people's attention at the earliest opportunity.

Professor Roy Davies
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Books Currently under Review

- Nixon and Aguado *Feature Extraction and Image Processing* (Adrian Clark)
- Faugeras and Luong *The Geometry of Multiple Images* (Oli Cooper)
- Hartley and Zisserman *Multiple View Geometry in Computer Vision* (Martin Lewin).

These are all scheduled for publication in the next issue of BMVA News.

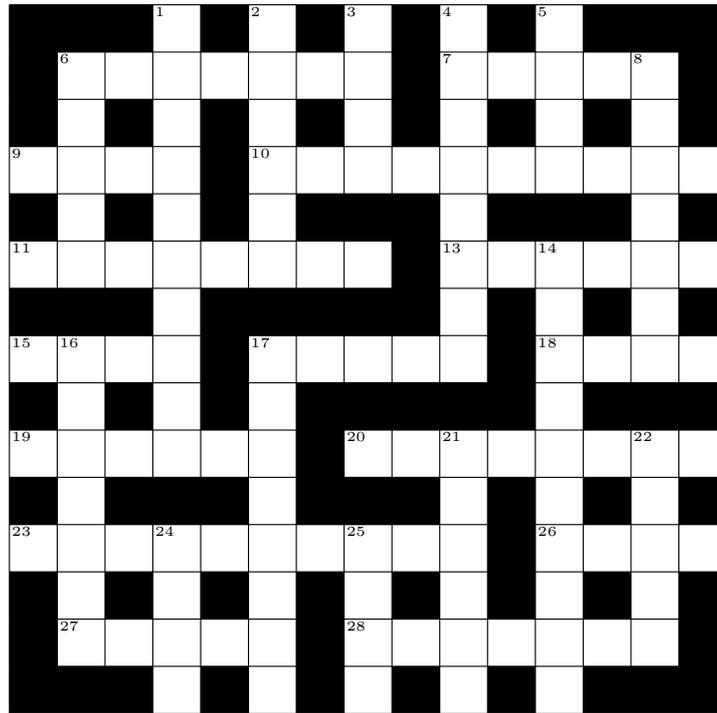
Book for Review

J.-L. Starck and F. Murtagh *Astronomical Image and Data Analysis*, Springer, 2002, ISBN 3 540 42885 2, hardback, xi + 289 pp.

Professor Roy Davies
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Christmas Crossword

Overleaf you will find the Christmas crossword, kindly donated by Richard Harvey (UEA). I hope everyone appreciates the skill with which he has got us started on this great new idea for BMVA News! —Ed.

**ACROSS**

- 6** Confused chairwoman, missing Active Appearance Model, tells us the location of BMVC 2003. (7)
- 7** Sam is puzzled when this morphological transform doesn't hit the foreground. (1,4)
- 9** In the same place, instinctive impulse about head of bigot. (4)
- 10** Camera parameters are integers around Royal Institution's points with one charge. (10)
- 11** Approaches blockings. (8)
- 13** Head of Novisad fronts press explanation of why graphics card doesn't work? (2,3)
- 15** Examination in Malaga zealotry. (4)
- 17** Draw around the sum of the eigenvalues? (5)
- 18** Urinated around Koenderink's structure. (4)
- 19** Fir cigarette-end? (6)
- 20** $2.7183\dots + 3.1416\dots + \frac{1}{z^2-1} \Big|_{z=\pm 1}$ = stereo intersections. (7)
- 23** Paul's impulse? (5,5)
- 26** Nervous part. Sounds like the Play's started! (4)
- 27** This intensity normalisation is implemented with genetic algorithm followed by one-thousand degree annealing. (5)
- 28** Remove arsenic from crazy Cocker Spaniels' noise. (7)

DOWN

- 1** Rainbow-like colour incites red mix-up. (10)
- 2** Number six is back atop our subject. (6)
- 3** Spirit photograph? (4)
- 4** Measure of light intricate dance air. (8)
- 5** Throws-away histogram. (4)
- 6** This prize sounds like a dead-ringer! (5)
- 8** Marquis takes on head accountant for eye movement. (7)
- 14** Eccentrically makes voids for mattes. (5,5)
- 16** Penrose has it on his floor? (1,6)
- 17** Re-render frantic rowed rat. (2,6)
- 21** Digital pictures of unreasonable ageism. (6)
- 22** Reduce the sound of Yorkshire retired jockey's former activity. (5)
- 24** Sounds like Cockney wounds robotic manipulators. (4)
- 25** Unprofitable function of estimation theory. (4)