

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 30 November 2001.

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Editorial

Some of you may have noticed that this issue is being published rather later than in previous years. The reason is that I have come to realise that August is a very difficult month to get copy for BMVA News, as many people are away, and those who are around are more concerned to spend August getting to grips with their research than writing nice articles for BMVA News (though in some cases holiday fever may have a bearing ...). The most sensible way around this problem is to delay this issue until late September, when some news will have filtered in from BMVC and from the Executive Committee meeting which takes place on the first day of BMVC. Naturally, this could lead to problems of lack of copy for later issues. So I have decided to produce future issues in December, March, June and September. I would, however, be grateful if members could write to me if there are any indications that this is not the best policy.

I have previously stated that I consider books to be important to the progress of the subject, and that I wish to promote book reviews in BMVA News. Unfortunately, some reviewers have in the past taken too long to write their reviews, so much so that interest in the book and the review has long since waned. So I have tried to develop new rules to keep reviewers on their toes. Bearing in mind that a book may arrive on someone's desk and then have a range of content that does not match the expectations obtained from the title, I decided to give reviewers a free look for one month, at which time they must return the book to me or guarantee to review it within a further two (absolute maximum three) months. I hope all will agree that this is a sensible policy, and I look forward to reviewers being more speedy in future! (No slight, by the way, on the author of the

book review on pp. 4–5 of this issue.) In this context, please turn to p. 6 for details of another book I have received for review.

Finally, the BMVA Committee heard with alarm that Professor Mike Duff, our first Distinguished Fellow, was very ill last April and had a major operation. He recovered well from this. I'm sure you will be happy for me to send him very best wishes for a complete recovery and best of health in the future.

Professor Roy Davies
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Call for Abstracts: Mathematical Methods in Computer Vision

On 16 January 2002 a 1-day Technical Meeting will be held at the Royal Statistical Society, London.

From wavelets to support vector machines, and other exotic beasts like the trace transform, from statistical methods to projective geometry, Mathematical methods for vision have been becoming more and more main stream research, replacing heuristic algorithms and simplistic approaches.

This one-day meeting is aimed to review some of the most popular of such methods, as applied to computer vision/image processing problems. The papers presented should be of tutorial nature, not necessarily presenting new work, but certainly presenting work in the context of image processing and computer vision, with emphasis on making the approaches transparent to the audience and addressing the practical aspects of the approach discussed. (No existence theorems please!)

Those interested to present their work are asked to submit a 100 word abstract by email to Maria Petrou (m.petrou@surrey.ac.uk) by 30 November 2001.

Professor Maria Petrou
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Annual Report of Activities

Last year was another successful year for BMVA. Our membership at the moment is almost 600 members, a 50% increase from last year! This must have been the result of the continuous effort to promote activity in the broad area of computer vision and pattern recognition. As will be seen below, our publicity activities were particularly visible last year.

The promoting leaflet we had produced the previous year was circulated to the 4000 UK recipients of the magazine *Image Processing Europe*.

Our presence in IPOT was well organised with demos presented by our members. Thanks to the activities of our publicity officer Dr Mirmehdi, we had new posters professionally made up for promoting BMVA activities and presenting the work of our members.

In addition, reports and articles were written on behalf of BMVA, for promoting computer vision among users, these being commissioned by magazines such as *Industrial Focus* and *Image Processing*.

With the increase of our activities, we also reached the point that some of the voluntary work offered by the executive committee members grew out of proportion for the overloaded academics we all are. As a result extra administrative help was needed.

A major change took place in terms of the secretariat of BMVA. Mrs Susan Duff who had run the BMVA secretariat for the previous two years could not take up the extra responsibilities we required from our secretariat, so we had to replace her with Royston Parkin, a firm of accountants which also takes up membership services. We are all grateful to Sue Duff for the care and helpfulness with which she run BMVA affairs.

The new secretariat helps organise the technical meetings and assists our treasurer in his duties. Another major change was the replacement of Dr Margaret Varga as our treasurer by Dr Tony Pridmore. The job of the treasurer is particularly demanding, and we are grateful to Margaret for having done it for several years. Another long-term hard working member of the committee, Dr Tim Cootes stepped down from the position of secretary and was replaced by Dr Paul Rosin who used to be our newsletter editor. Our new editor is Professor Roy Davies. Tim and Paul have offered, and are still offering, a lot of their time to BMVA and I would like to thank them on behalf of all our members, for their services as secretary and Newsletter editor respectively, during the previous several years.

Our collaboration with other organisations was strengthened, with the appointment on the UKIVA

executive committee of Dr John Gilby, a member of our own executive. In addition, our members took part in the DTI initiative Outreach and helped make it a success – so much so that extra events are now being planned in the vision area. Three successful one-day technical meetings were organised, plus one joint with the Royal Statistical Society. The latter turned out to be particularly successful with 80 attendees.

Our links with RSS were further strengthened by moving the venue of our technical meetings to their premises. This made financial sense, but also brings us in closer contact with a community many members of which work in the vision area. For the forthcoming year four technical meetings are already in the pipeline and there may be room for one or two more.

From the organisational point of view, we tried to rationalise our rules and regulations. For example, we established our rules under which we can sponsor events; rules by which we promote and advertise external events; rules according to which we offer bursaries; reduced subscription rates for group registration etc; and we established a protocol of collaboration with the Editorial Board of the journal Image and Vision Computing for the production of the special issue after each BMVC.

Our web pages were brought up to scratch by Dr Adrian Clark, and Dr Andrew Fitzgibbon kindly offered to give a hand and keep them updated. There is a link now to the page Dr Bowden had created with research interests of our members, and it is hoped that this will be the focal point to attract users to the services our members can offer. For the future it is planned to create professional web pages aimed at undergraduates, with the aim to attract them to do PhDs in our area. Such pages are currently under construction.

Our finances have been very healthy, so we are able to keep the subscription at £20.

Preliminary preparations for ICPR 2004 were started and Professor Kittler has had a lot of work during the last winter to find a suitable venue. The problems seem to have been sorted now, and the ICPR 2004 in Cambridge is going ahead.

With another successful BMVC behind us, we are all looking ahead now to a new successful academic year!

Professor Maria Petrou
BMVA Chairman
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The Synthesis of the New Executive Committee of BMVA

The executive committee of BMVA consists of ten members, five of which are elected every year with a two year rotation period. This year there were five nominations for the five positions that became vacant and so no election took place. The elected members of the new committee are:

Mr Adaway, Dr Bowden, Dr Cootes, Professor Davies, Dr Ellis, Professor Kittler, Professor Petrou, Dr Pridmore, Dr Rosin and Dr Charles Taylor. Professor Chris Taylor remains as the ex-officio secretary of the BMVA company, and Dr Majid Mirmehdi the co-opted publicity officer.

In its efforts to broaden its basis, BMVA, in addition to the elected members of the committee, also co-opts certain other members. So, in addition to the above names, the executive committee also includes Dr Courtney from VAL of Manchester University, Dr Gilby from Sira, Dr Pollard from Hewlett Packard and Dr Siebert who represents the Scottish Chapter and the Imaging Faraday partnership.

Professor Maria Petrou
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The Sullivan Doctoral Thesis Prize

The Sullivan doctoral thesis prize this year was awarded to **Richard Bowden** for his PhD thesis entitled “Learning non-linear models of shape and motion”.

The prize is awarded for the best thesis that has been examined during the calendar year prior to the BMVC at which it is awarded and it is given, with a cheque of £350, during the BMVC banquet.

BMVA is already soliciting nominations for next year’s prize among theses that have been examined during the calendar year 2001.

Professor Maria Petrou
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Prizes at BMVC 2001

Over the years BMVA has created a series of prizes for the BMVC papers in order to stimulate and encourage high quality submissions and presentations. Four such prizes are distributed each year. The prizes at BMVC 2001 were awarded during the BMVC 2001 banquet, as follows:

The best poster prize went to A. Hanbury and J. Serra, Ecole des Mines de Paris for their poster "Mathematical Morphology in the HLS Colour Space".

The prize is worth £200 and is awarded for the best poster judged by members of the programme committee not only for its appearance, but also for its content, both factors being equally weighted.

The best demonstration prize is sponsored by UKIVA and it was awarded to John Oakley, UMIST for their demo "Video Image Enhancement for Terrestrial, Aerial and Underwater Environments". The prize, worth £200, was given to the recipients by Don Braggins on behalf of UKIVA.

The third prize is the Industry prize awarded for the paper which is most industrially relevant and is sponsored by CRS (Computer Recognition Systems). It is worth £500 and this year it was awarded to H.H. Thodberg and A. Rosholm from Pronosco, Denmark, for their paper "Application of the Active Shape Model in a Commercial Medical Device for Bone Densitometry".

The Science prize, awarded for the best paper from the scientific point of view, was this year sponsored by Hewlett Packard. It is worth £500 and it was awarded to Y. Li, S. Gong and H. Liddell, from Queen Mary, University of London, for their paper "Recognising Trajectories of Facial Identities Using Kernel Discriminant Analysis".

Finally, from this year we have another prize, very generously offered by Image-Metrics plc, for the best Model Based Vision paper. It is worth £750 and was awarded by Alan Brett to R.H. Davies, T.F. Cootes, C.J. Twining and C.J. Taylor, for the paper "An Information Theoretic Approach to Statistical Shape Modelling".

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Book review – Dynamic Vision: From Images to Face Recognition

S. Gong, S.J. McKenna and A. Psarrou, *Dynamic Vision: From Images to Face Recognition*, World Scientific Publishing, May 2000, ISBN 1-86094-181-8, hardback £38, 364 pp.

Face recognition has been and still is a major research area for computer vision. This book is as good a representation of the state of the art as there is available. The book addresses in detail many of the stages required to achieve face recognition from location to tracking and ultimately recognition. The early stages of location and tracking are challenging, as the scenes are often complex and dynamically changing. Recognition is difficult because of variations in lighting, viewpoint, body movement and facial expression.

The book should also be of interest to the general computer vision community. Face recognition is one of the most demanding areas of vision and as such has had a large impact on vision research, because of many of the difficult issues raised; many of these issues are relevant to object recognition in general and other areas including visual surveillance, verification, access control, video conferencing and visually mediated interaction.

The volume describes models and algorithms that are capable of performing face recognition. The emphasis is on robust methods that can operate under a variety of conditions. Many contemporary approaches used in computer vision are addressed in this context, including visual motion detection and estimation, adaptable colour models, learning under uncertainty, tracking and view-based learning. Some key underlying techniques that have a wide range of application beyond the scope of the book are well described including statistical learning in high-dimensional feature spaces; associated with this are vector space dimensionality reduction, 3D reconstruction, stereo correspondence, 2D view-based representations, image filtering, linear modelling techniques (PCA); temporal prediction models including Kalman filtering, hidden Markov models, condensation and single and multiple view identification.

The book is well organised in four main parts plus extensive appendices. The background gives a grounding in the key areas of perception and representation, and statistical models for uncertain learning and classification. The second part introduces more advanced vision techniques for searching for visual

cues, face modelling, pose estimation and tracking. In particular, attention is focused using motion and colour cues. The next part deals with the identification of faces in single and multiple views and moving faces. The final part deals with perceptual integration and related areas beyond faces. Of particular note is that at the end of each chapter there is a section that relates biological perspectives of the topics under discussion. The main emphasis is on computationally viable and fundamentally algorithmic approaches which have been built upon recent theories of visual perception and learning; however some approaches have been drawn from or have some common ground with psychophysical and neurobiological approaches. This is a welcome aspect of the text, which puts the work into a wider context.

In summary, this book is a welcome addition to the computer vision literature. I believe that it is the only text available that gives a broad coverage to the area of face recognition. However, it is much more than just a treatise of this area. The techniques that are described in the book have a much more general application to many related areas. As such the book does a very good job of explaining these techniques and it is thus of interest to the computer vision community. The book probably requires a basic understanding of linear algebra, vectors, matrices and the like. However, readers without such a grasp of mathematics may still gain something from the book.

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BMVC 2001 Conference Report

This year's British Machine Vision Conference was held in Manchester. Dr Tim Cootes, the chairman, gave a memorable opening to the conference which adopted the theme of the film "2001 - A Space Odyssey". Although we have not achieved the sophistication of HAL, it is interesting to reflect on how far computer vision has progressed since the film was made.

The tutorial this year was on the subject of performance evaluation. Although often considered a dull and difficult subject, its importance has been increasingly recognised within the computer vision community. An important message of the tutorial was that performance evaluation doesn't just allow

you to assess a system but it also enables you to build effective, robust ones.

Of the papers with a strong application base, the one entitled "Illumination technique for optical dynamic range compression and offset" was of particular interest. It described a way of illuminating scenes that are subject to very large lighting variations. The application shown was using a camera in a car to monitor the occupant position so that airbags can be inflated more safely. They showed how good images could be obtained under a wide variety of ambient conditions from night to direct sunlight.

The industrial prize was awarded to a paper by the Danish company Pronosco on a commercial system which uses active shape models to analyse X-ray images for the identification of osteoporosis. It was particularly good to see a company presenting the science behind one of their products at a peer-reviewed conference.

Graham Watson of Rolls Royce, a member of the Intelligent Imaging Programme, helped judge the demonstration prize which was awarded to Dr John Oakley of UMIST for a system that was correcting video for atmospheric effects. The system is designed primarily for security applications and was shown correcting video images of a very foggy Manchester airport. The result was a transformation from a murky image to one with normal colours and contrast.

Perhaps the most unusual paper was presented by Professor Aaron Sloman of Birmingham University. It was more of a call-to-arms rather than a technical presentation. Aaron's aim was to inspire more people to work in the area of integrating vision and artificial intelligence. His thesis is that much of the work in AI is fragmented and that there is a real risk that the results of isolated research will be unsuitable for future integration. If he has encouraged just a few of the conference attendees to think more about how to build complete systems then he will have accomplished something valuable.

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²We are grateful to Sira for permission to reproduce this timely report which was originally published in Sira's Intelligent Imaging Programme Newsletter: naturally it is slanted towards the mainly industrial participants in this programme but should be of interest for BMVA members - Ed.

Book for review

Would you like to have the opportunity to review a book for BMVA News? If you review a book you can of course keep it for your own use! Books will be sent out on a first come–first served basis. A book that has recently been received for review is:

L. da F. Costa and R.M. Cesar *Shape Analysis and Classification: Theory and Practice*, CRC Press, 2000, ISBN 084 933 493 4, hardback £56, 456 pp.

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**See the BMVA website for further
up-to-date information on BMVA
activities:**

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