EDITORS NOTE

As far as the BMVA is concerned the last three months has been very busy with the occurrence of its first major conference, the first Committee elections, an Annual General Meeting and a very successful inaugural technical meeting on the interface between machine and natural vision. Both the BMVA90 Conference and the technical meeting are reported elsewhere in the newsletter.

The Committee elections were held by postal ballot in late August/early September and over 100 ballot papers were returned. This very encouraging response has resulted in the following Committee being elected:

- Prof Peter Saraga (*Philips Research Labs, Redhill*)
- Prof Micheal Duff (*University College London*)
- Dr Josef Kittler (*Surrey University*)
- Prof Chris Taylor (*Manchester University*)
- Dr Bernard Buxton (*GEC Hirst Research Labs*)
- Dr John Illingworth (*Surrey University*)
- Mr Andrew Sleigh (*RSRE*)
- Mr Geoff Sullivan (*Reading University*)
- Dr Peter Mowforth (*Turing Institute, Glasgow*)
- Mr Micheal Brown (*British Aerospace Sowerby Labs*)
- Dr Micheal Fairhurst (*Kent University*)
- Dr John Knapman (*IBM Research Centre, Winchester*)

All the Committee have served in some capacity or been active members within the two former constituent organisations, AVC and BPRA.

At the first official meeting of the new Committee the following Association officers were appointed:

Chairman: Prof Chris Taylor
Secretary: Dr John Illingworth
Treasurer: Mr Geoff Sullivan
Membership Secretary: Ms Annette Harris
IAPR Representatives: Prof Micheal Duff
Dr Josef Kittler

The Associations first General Meeting was held during an evening of the BMVC90 conference at Oxford. Again it was encouraging to report a healthy attendence figure (nearly 50 people abandoning the competing attractions of an open bar!) and a lively discussion of Associations activities. Among suggestions were changes in BMVC format, including the introduction of tutorials and/or workshop days, and the provision of more services to the members, in particular the benefits and costs of providing a vision abstracts service. Several members were unaware of existing information services, such as the PIXEL and VISION-LIST email services, and therefore more details are provided in an article in this newsletter. The enthusiasm and interest of members is much appreciated by the new Commitee and will form an important input in discussions concerning future activities. Anyone who was unable to attend the meeting but would like to contribute to discussions should contact the Association Secretary or any of the Committee.

Finally, the observant reader will have noted that I have been appointed to the post of Association Secretary and therefore, after two immensely interesting years, shall be relinquishing the BMVA News editorship. As with all jobs the editorship has both good and bad points but from my own experience I recommend it as a way of keeping up to date with news while making many valuable contacts and establishing an active role in the affairs of the Association. Anyone interested in such opportunities is invited to contact me for further details. In the meantime, as the Association nears its first anniversary, I hope that you all enjoy the current issue of the newsletter and look forward to receiving the next issue.

John Illingworth
Surrey University

British Machine Vision Conference

The first BMVC organised by the BMVA was held in Oxford between 24-27 September 1990. It is the joint successor of the annual Alvey Vision Conference and the bieniel BPRA international conference. The topical focus was computer vision and the meeting retained much of the character of the Alvey series. Accommodation was provided in St Hughes College which was an enjoyable fifteen minutes walk from the conference venue in the Department of Experimental Psychology. The programme consisted of two high quality invited presentations, a plenary track of oral presentations and a poster session. There was also an exhibition of commercial image processing equipment.

In the first invited presentation, Steve White (Technical Arts Corporation) gave a review of active depth sensing technology. The talk focussed on industrial vision applications and was nicely illustrated by a 3D tube inspection system developed for the Boeing Corporation by Technical Arts. This example brought home some of the constraints in terms of throughput, robustness and accuracy.

In the second invited talk, Steve Zucker motivated an approach to curve detection from neurobiology. The topic was nicely introduced with a description of the neurobiological structure and function of the visual cortex. Some of the cell-phenomena attributed to orientation selection were used to motivate a computational model for curve detection based on tangent fields. The content of this talk was well judged and provided a nice review for the non-biologist.

Both the main track of oral presentations and the poster track contained some high-quality and novel research. In keeping with the predominant vision theme of the meeting, the oral track had sessions on motion, stereopsis, shape, feature extraction and model-based vision. There were also sessions devoted to application areas such as medical image understanding, hardware and industrial inspection. This year the poster-track was enlarged to occupy two-sessions with authors being offered the option of presenting their results in this format. This was a valuable enhancement of the programme.

As usual the strengths of UK groups in the areas of motion (Plessey) and stereposis (Oxford and Shefield) were much in evidence. My own interests were mainly catered for in the sessions on shape and feature extraction. Some interesting ideas here were the use of transformational invariants for 2D shape recognition, robust statistical estimation of 2D curve parameters, a scale-space primal sketch and a probabilistic method for line grouping.

The Conference Committee (Andy Sleigh, Andrew Zissermann, Rob Series, David Murray, Janet Batten and Paul Beardsley) are to be congratulated on a high quality and smoothly organised meeting. Finally, Rob Series asked me to point out that if you missed the event, then its not too late to buy a copy of the proceedings.

Edwin Hancock
Rutherford Appleton Laboratory

BMVA Natural Vision Meeting

A one day meeting on "Natural Vision: Implications for Machine Vision" was held in London on 24 October 1990. This was the first of a series of annual BMVA meetings in which members of the Natural and Machine Vision Communities will be invited to exchange recent research concepts. It is intended that the emphasis will alternate bi-annually between Natural and Machine Vision. Six distinguished speakers made presentations lasting 45 mins each. Dr John Robson (Cambridge) described recent findings in single cell neurophysiology (particularly their gain characteristics and linearity properties), and went on to discuss the role of multiple neurons in vision. The significance of the information bottleneck represented by the ganglion cells of the retina was discussed. Prof Mike Morgan (Edinburgh) discussed psychophysical studies of the "neural image", and described experiments aimed at discovering features of the neural response which have direct perceptual significance. The greater importance of phase information (rather than amplitude) was demonstrated; and by mixing the two, Mrs T was smoothly transformed into Lenin! Dr Yves Burnod (Paris) reviewed the physiological connectivity of the "what" (infero-temporal) and the "where" (parietal) visual pathways, and described a computer simulation of neural networks which mimic this separation of function. The neural basis of eye-hand coordination were also discussed. Dr Brian Rogers (Oxford) discussed the similarity between the mechanisms of binocular stereopsis and motion parallax. Illusions of depth were illustrated by means of a stereo projector system. Experiments to examine whether simple differential geometrical deformations are primary cues to depth were reported. Dr Dave Perett (St Andrews) presented a summary of recent findings on Infero-temporal neurons in monkeys, which show a remarkable selectivity to human (and other) faces. Some neurons are "object-centred" and their response shows little obvious dependency on the luminance distribution of the image. These findings were discussed with reference to Koenderink and van Doorn's characteristic views approach to object recognition. Prof Vicki Bruce (Nottingham) reviewed the psychology of face recognition and interpretation. Clinical experience, and psychological experiments argue for a separation between the mechanisms for description of faces and their recognition. Recent work on computer programs for face

recognition was reviewed. Forty nine people attended the meeting, including thirty three BMVA members. An extended report of the meeting is available from the organiser (g.sullivan@uk.ac.reading).

Geoff Sullivan
Reading University

Public Services

At the recent General Meeting several BMVA members were unaware of a range of public domain services and software which are available over computer networks. There are several electronic newsletter and bulletin board services in the vision/image processing/pattern recognition area. The two most important are the Vision-List, which is broadcast worldwide and coordinated by Phil Kahn from the U.S., and the PIXEL list, which is largely targeted at a U.K. audience and is moderated by Adrian Clark at Essex University. Both these lists carry news about conferences, meetings and jobs as well information on algorithms, hardware and software. Users can send requests for information on any topic to the list and it will be broadcast to all subscribers. To become registered with these services a message must be sent to the appropriate list coordinator:
Vision-List-Request@ADS.COM : for Vision-List
pixel-request@uk.ac.essex : for pixel
In order to minimise traffic on the computer network it is usual to have a Postmaster or manager at major sites who issues such request to external sites, receives the consequent mail and then redistributes it to local users. Please check with your local site manager to arrange this.

In addition to the above newsletter type services there are many archives which can be accessed by anonymous FTP. Both the Vision-List and Pixel have associated archives which contain large amounts of code and quite a lot of imagery. At the moment the Pixel archive is not accessible by FTP but items can be obtained by sending Sun cartridges or magtapes directly to Adrian Clark. Plans are in hand to make the archive accessible by FTP and an index of items was recently distributed in Pixel newsletter Vol 90, Issue 30. A further source of image data is being compiled at the Turing Institute in Glasgow and accessing it via FTP was described in detail in Vol 1, No 2, May 1990 edition of BMVA News.

This article has provide only a brief indication of some of the sources of public domain services. The compilation of a more comprehensive list would be much welcomed for inclusion in a future newsletter.

John Illingworth
Surrey University

Book Reviews

Image Synthesis: Elementary Algorithms
by Gerard Hegron, MIT Press
Cambridge, MA, 1988, ISBN 0-262-08166-0

This book is a collection of elementary algorithms for image synthesis. Almost no previous knowledge of the subject is assumed, except of some familiarity with programming. The book is useful for those starting their work in the field of image synthesis. However, the usefulness of the book is severely limited by a large number of errors.

Chapter 1 overviews general problems of elementary processing in image synthesis, and gives a few basic definitions, eg. user and screen space, ways of coding an image etc.

Basic algorithms for curve generation on a surface of dots are summarized in Chapter 2. The algorithms are divided in two classes: 'numerical' and 'incremental'. Incremental methods are analyzed in more detail. Algorithms for generating straight line segments, circles, ellipses, parabolas and hyperbolas are given separately. The chapter concludes with the analysis of ways of improving line drawings. Some of the algorithms are presented in full detail (eg. generating straight line segments), while only the main guidelines are given of the more complicated ones.

Chapter 3 is dedicated to the problem of dealing with polygons. Four types of processing are analyzed separately as follows: (i) Coloring, ie. marking all the points inside a closed connected region starting from a specified seed point. (ii) Filling a zone defined by a set of contours. The zone may have holes and may consist of non-connected regions. The filling pattern may even be text (the algorithm for solving this problem is given in the book). (iii) Decomposition of polygonal zones into convex subparts. By applying this algorithm to a complex zone, the problem of filling it can be made easier; (iv) Cross-hatching - the method of oblique hatching of polygonal contours is analyzed in more detail and the algorithm is given.

Cutouts are discussed in Chapter 4. Algorithms performing cutout by rectangular and convex windows are included. The problem of intersection of two non-convex polygons is discussed briefly, while the problem of intersection of two convex polygons is analyzed in detail. The problem of cutting one zone by another is considered not elementary, so that only its main characteristics are analyzed.

It is a pity that such an interesting subject has not been presented and worked out more carefully. There are a number of errors throughout the book, from printing (eg. numerical) to errors in equations and algorithms.

Although some of the errors are obvious and thus easily correctable, such a great number of them distracts the reader. An additional difficulty of the book is its non-homogeneity, both in graphical design (eg. algorithms are printed in several different fonts), and, what is much worse, in the methodology. Algorithms are presented in different ways (pascal-like pseudo code, listing of BA-SIC program, natural language description). It seems also as if the book is the result of shortening a larger text (probably the author's PhD thesis). The result of this is that some of the referenced equations and figures are missing.

The three main chapters are of almost equal length. It seems to me that too much space is devoted to Chapter 2 (eg. two algorithms for generating straight lines, rewriting of all algorithms for improved line drawings etc), while some more complicated problems especially in Chapter 4 should have been analyzed in more detail. In my opinion Chapter 3 is the best balanced.

The book is useful for those who plan to start working in the area of image synthesis. However, the reader must have a lot of patience in order to cope with the errors.

Djordje Jankovic
Institute "Boris Kidric" - Beograd, Yugoslavia.

Mammography Meeting

The IBM UK Scientific Centre at Winchester and the Department of Medical Biophysics at the University of Manchester are jointly hosting a meeting for active workers in the field of interpretation of mammograms. The meeting will be held on the 14th and 15th of January 1991 at Winchester. Those interested in participating are asked to contact Sue Astley, Department of Medical Biophysics, University of Manchester for further details (tel: 061 275 5162).

IEE Signal Processing Conf.

The 6th International IEE Conference on Processing of Signals in Communications is to be held at the University of Loughborough from 2-5 September 1991. Papers are solicited in applications of neural networks, image interpretation and coding techniques, knowledge based signal processing, speech synthesis, recognition and coding and signal recognition and analysis. Synopses of papers consisting of 2 A4 pages should be sent to IEE Conference Services, Savoy Place, London WC2R OBL by 21 January 1991. Authors will be notified of provisional acceptance during February 1991.

NCAF Applications Forum

A new organisation has been formed recently for those people actively developing products and services using neural networks. The Neural Network Applications Forum, NCAF, will provide a meeting place for engineers, software developers, researchers and managers to share their experience and see new products. Initially the NCAF will hold one-day meetings four times a year at different venues around the country. The first meeting was held on 27th September in Southampton and attracted 40 participants, most of whom work in major UK compamies. The next meeting will be held on 9th January 1991. Further information can be obtained from Jonathon Cashdan (051-224 3270) or Mike Wynne-Jones, 11 Lodge Drive, Malvern, Worcs (0684 894344).

AVA '91

The Annual Meeting of the Applied Vision Association, AVA, will be held from 8th-10th April 1991 at Langdale Hall, University of Manchester. The theme of the meeting will be "Perceiving Degraded Images". The meeting will also include the Fifth Geoffrey Burton Memorial Lecture which will be given by Professor Don Pearson of Essex University on "The Search for Image Primitives".

Papers are invited for the meeting on the following topics: interpretation of processed images, the use of stylised, binary, encoded, filtered or cartoon images to convey information, user performance with noisy images degraded by sensor, transmitter or display characteristics, functional results of visual impairment, deficits in recognition, orientation and mobility performance, the design of optical instruments and visual aids: aberrations, MFT's, optimising performance.

Abstracts of intended contributions should be submitted by 1 December to Dr Chris Dickinson, Dept of Optometry and Vision Sciences, UMIST, PO Box 88, Manchester M60 1QD. Tel: 061-200-3874 or Fax: 061-200-3887.

IPMI'91

The 12th International Conference on Information Processing in Medical Imaging will be held in Wye College, Kent between 7-12 July 1991. The conference will be held in the style of a workshop with all participants expected to contrinute. Topics covered will include image reconstruction from sparse and multiple projectsions, segmentation, quantitative measurements, display technologies for 3D and multi-parameter datasets and clinical applications. Full length papers (15 pages maximum) should be sent by 19 December 1990 to Dr D.J. Hawkes, UMDS, Guys Hospital, St Thomas' Street, London SE1 9RT. Further details can be obtained from Dr Hawkes (Fax: +44 71 955 4532, email: ipmi@portia.umds.lon.ac.uk).

Situations Vacant

Kings College, London

Applications are invited for a post to work on an SERC funded project called "A buyers guide to the Hough Transform". The project seeks to develop rigorous procedures for the evaluation and comparison of various Hough Transform algorithms. This will be done in terms of error performance, hardware and software complexity, suitability for parallel implementation and application fields. The work will involve both analytical and experimental skills. Applicants should have recently obtained or shortly expect to obtain a PhD in a relevant subject. Enquiries and CVs to Dr. Mark Sandler, Electrical Engineering Dept. (tel: 071-873-2365, email: UDEE040@UK.AC.KCL.CC.OAK) or Dr. Violet Leavers, Dept. of Physics (tel: 071-836-5454 ext:2799, email: VFL@UK.AC.KCL.PH.IPG) at King's College, Strand, London WC2R 2LS

DIARY

3 December 1990 IEE Colloquium on "The application of fractal techniques in image processing", London.

3-7 December 1990 IEEE 3rd International Conference on Computer Vision, Osaka, Japan

17 December 1990 IEE Colloquium on "Techniques for speech processing", London

20 December 1990 SGM Meeting on "Computers in the study of Motility", York University.

26-27 December 1990 7th Israeli Conference on Artificial Intelligence and Computer Vision, Tel-Aviv, Israel.

14-15 January 1991 Meeting on "Interpretation of Mammograms", IBM Research Centre, Winchester

12 February 1991 IEE Colloquium on "Neural Networks: design techniques and tools", London