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.

Contents

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Editorial

Hello pixel people, I am your new editor. Edwin Hancock is BMVC chairman this year, and he wisely decided that he couldn't effectively do two such important jobs at the same time. For those of you who don't know me, I am an active vision researcher at Oxford whose greatest contribution to computer vision, the paper: "BARRY: An Autonomous Train-Spotter" was famously *rejected* from last year's BMVC on the grounds of being too scientific, and eventually appeared in the 1st New Zealand vision conference (Proc. IVCNZ'93: ISBN 0-478-07151-5). But enough about me. We have updates on BMVC'94 from Edwin Hancock and on ECCV'94 from our man in Stockholm, Jonas Garding. Ralph Highnam has provided a very interesting and informative article about the current state of medical imaging, as exemplified by the recent Rank Prize meeting, and Neil Thacker has some observations on IPOT '94, the recent image processing exhibition. We have reports on the BMVA technical meetings: "Silicon Systems" and "Robot Guidance". Geoff Sullivan has two articles, on the SERC/EPSRC Integrated Machine Vision initiative and the European input into the ARPA-funded Image Understanding Environment. Tim Ellis has news of the new BMVA teaching initiative. Finally Adrian Clarke has some information on a new abstract service (INSPEC) being provided by the IEE.

BMVC'94 Update

Preparations for this years conference are well advanced. As mentioned in a previous article, the invited speakers are to be Professors Koenderink and Yamamoto, whose topics are 3D shape and document analysis. The pre-conference tutorial will cover the use of statistical methods in vision and will be jointly presented by Josef Kittler and Chris Taylor. Papers are already flooding in, but there is still time to submit before the 25th April deadline. As in previous years, there will be special edition of Image and Vision Computing devoted to the best papers submitted to the conference. There will also be cash prizes for the best scientific paper, the most industrially relevant paper and the best poster presentation. As an added incentive for those who find university accommodation too spartan, there will be the option of rooms with en-suite facilities for a small additional cost.

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ECCV'94 Update

The Third European Conference on Computer Vision will take place in Stockholm, Sweden, 2-6 May 1994. If you still haven't received the ECCV'94 Advance Program and registration information, send email to `eccv94@bion.kth.se`, or fax to +46 8 723 0302.

Among the 311 submitted contributions, 58 were selected as papers for oral presentation and another 56 were selected for poster presentation. The selected contributions were distributed as follows on 14 different countries of origin:

Country	Papers	Posters	Submitted
USA	18	15	80
France	9	18	61
UK	9	10	34
Sweden	6	1	14
Germany	4	2	24
Israel	3	1	7
Switzerland	2	0	4
Italy	1	4	18
Japan	1	2	18
Belgium	1	2	6
Canada	1	1	8
Slovenia	1	1	3
Finland	1	0	5
Singapore	1	0	4

Scientific Workshops

On May 7 the following workshops will be organised by members of the ESPRIT Basic Research Action.

- New Results with Geometric Invariants (Organiser: L Van Gool)
- Natural and Artificial Visual Sensors (Organiser: G. Sandini)
- Neural Networks in Computer Vision (Organiser: J. Crowley)

Separate registration is necessary for these workshops. For information please contact

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Cultural Events

Below is a small sample of the cultural events scheduled to take place during ECCV'94. A complete list will be available in the brochure "Stockholm This Week" which will be included in the registration package.

Note: The telephone numbers listed below should be prefixed with 010 46 8 if dialled from the UK.

Exhibitions

Leonardo da Vinci. Stockholm Cultural Centre.

Pop/Rock

3/5 Jethro Tull. Cirkus, Djurgarden. Tel 660 1685.
3/5 Sanne Salomonsen. Gino, Birger Jarlsgatan 27. Tel 209470.

Jazz/Blues

6/5 20:45 Ohman Organ Grinders. Stampen, Stora Nygatan 5, Old Town. Tel 205794.

Classical Music

4/5 19:30 Murray Perahia - piano. Concert Hall, Hotorget. Tel 102110
4/5 18:30 Percussion concert. Berwald Concert Hall, Strandvagen 69. Tel 784 1800.
5/5 19:30 Piano concert with Donatella Pieri and Claudia Ronde. Italian Cultural Institute, Gardesgatan 14. Tel 660 33 56.
6/5 19:30 Young instrumentalists - soloists from Denmark, Finland, Greece, Italy, Norway, Portugal, Spain and Sweden. Berwald Concert Hall, Strandvagen 69. Tel 784 1800.

Opera

4-5-6/5 19:00 Dido and Aeneas (Purcell). People's Opera, Hornsgatan 72. Tel 658 5300.

Dance/Ballet

5-6/5 19:30 Coppelia. Performed by the Swedish School of Ballet. Opera House, main stage. Gustav Adolfs torg. Tel 248240.

ECCV'94,
c/o Jonas Garding,
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Email: `eccv94@bion.kth.se`

Medical Imaging

In December 1993 the Rank Prize Funds organised a mini-symposium on Medical Imaging. The Rank Prize Funds were established in 1972 to recognise and foster significant advances in certain areas of science. The mini-symposia are small workshops in which about 10 leading scientists in a particular field are invited to meet 20 or so younger researchers for two and half days of talks and discussions in an informal atmosphere.

The Medical Imaging mini-symposium was organised by Sue Astley (University of Manchester), Jo Hajnal (Hammersmith Hospital) and Ralph Highnam (University of Oxford). The programme covered nine imaging modalities: magnetic resonance imaging (MRI), microscopy, ultrasound, x-rays, positron emission tomography (PET), single photon emission tomography (SPECT), thermal imaging, optical imaging and magnetoencephalography (MEG). The talks ranged from design of the equipment through to image analysis. In this brief note I shall try and give a flavour of the generic problems which exist in medical imaging and that are being tackled using image processing techniques.

Perhaps the most obvious task for image processing in medical imaging is that of image interpretation. There are two reasons for this. The first is that the sheer mass of data being generated in medical imaging is becoming excessive and a computer-aided approach makes this more manageable. The second is that clinicians are subjective observers, and it might be possible to make the computer an objective observer so that more reliable relationships between the signs and causes can be constructed. The problem with image interpretation in medical images is that the signs are typically so complex and ill-defined that it takes even humans many years of training to be able to detect them. Indeed, in recent times vision researchers have stopped talking about replacing the clinicians and instead talk of aiding the clinicians.

One of the common themes of the symposium was that of modelling. Models, of one form or another, were discussed in conjunction with many aspects of medical imaging. There were models of the anatomy, physiology, imaging process and decision-making process. The kind of models discussed were mostly physics-based but parametric shape models were also included. Any form of modelling requires an understanding of the problem, and thus, as Chris Taylor (University of Manchester) pointed out, modelling makes for a principled approach.

Image registration is essential for any attempts at

sensor data fusion; a buzzword in the image processing community but a term relatively unknown in the medical community. There are many registration problems in medical imaging and many more will arise as the the information provided by 3D techniques such as Computed Tomography (CT) and MRI is combined to improve diagnosis. An important conventional problem that requires image registration is comparing images over time, or with treatment. One of the major problems with image registration in medical images is the deformation that most objects of interest can show. This deformation can arise for a number of reasons, notably differences in external forces, the heart beating and the breathing mechanism within the body. The problem, of course, is differentiating between deformation due to normal occurrences, and deformation due to malign change in the object of interest.

Some of the problems leading to object deformation also lead to one of the key problems in many modalities, that of motion artifacts. These artifacts range from simple blurring through to introduction of more complex signs such as "ghosts" in MRI images. The talks at the symposium looked at two ways of tackling the problem. The first is making the image acquisition fast enough that object movement no longer becomes a problem. This approach has been successful, but there is always a trade off between speed and image noise and resolution. As one of the speakers noted, an additional advantage to speeding up image acquisition is that the imaging parameters might be optimised in real time, as well as allowing imaging of fast actions. The second approach to motion artifacts is applying image processing techniques to detect and remove the artifacts.

Another key theme of the symposium was quantification. Functional or physiological imaging tends to deal with quantitative data and as new techniques are being developed for these purposes quantification is becoming an area of interest. As Mark Henkelman (University of Toronto) pointed out, in MRI the drive towards visualising the internal anatomy removed quantitative data in preference to producing a picture that the clinicians liked. Several of the talks detailed computational approaches to calculating quantitative measures.

The growth in 3D imaging has led to much work on the best way to visualise this data. This visualisation is important not only for diagnosis but also, as Derek Hill (Guy's and St. Thomas' Hospital) discussed, for surgery. Typically, the 3D image is viewed as a series of slices through the object of interest and the viewers use their visual processes to construct the third dimension. It is likely that virtual reality techniques will make a significant contribution in this areas.

All of the 3D imaging techniques require processing to produce images representing the object at spatial locations. MRI uses Fourier transforms, whereas techniques such as CT have to use more complex reconstruction algorithms. The speed of these reconstruction algorithms is a limiting factor, and has to be overcome before the techniques can become real-time. Addressing this issue, Gabor Herman (University of Pennsylvania) made the interesting observation that algorithms that do not converge in the limit tend to give good estimates quickly.

Along with the image processing aspect, the symposium also covered a wide range of innovations in the medical imaging field. With talks on echo planar imaging, a fast MRI technique, through to intravascual ultrasound imaging, where a minute probe is passed through vessels, and MEG, which is showing great promise in determining locations of brain activity. These talks highlighted the fact that there is a great deal of medical imaging research going on that is not image processing, and it is perhaps worth noting that some 80% of medical imaging is still analogue.

It was clear from the symposium that there is a complex interaction between image processing and medical innovation, and that gains are sometimes to be made from new techniques in one or both area. Gains can be defined as finding additional information, or from tipping the balance of the great trade-off between radiation dose, invasiveness, time and expense towards patient comfort, image quality and resolution. One view put forward at the symposium is that post-processing will dominate medical imaging advances, but this should be tempered by the realisation that if the information is not there it cannot be recovered.

Ralph Highnam,
Oxford University.
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IPOT '94

The BMVA manned a stand at the recent Image Processing and Optic Technology exhibition at the NEC (Feb 17-20). There were a wide range of acceleration hardware and new digital camera technology on display along with (the now familiar) image processing software products.

The exhibition was used as an opportunity to show the new BMVA video which many new academic projects in the U.K. There was a lot of interest from industrial visitors to the exhibition, particularly in the areas of traffic monitoring and face recognition. The official BMVA representatives at the show were myself and Phil McLauchlan. We had many discussions during which we informed industrialists of the collaborative research schemes through which they can gain access to academic research (IMV, ACME, SMART, ROPA etc.). This information was, on the whole, greeted with enthusiasm, but the idea of collaborating with academia was still clearly unfamiliar (if not a direct source of humour) to some.

During discussions we provided where possible the names of contacts for suitable academic research groups. We believe that the BMVA has an important role to play in this area given the direction that funding for academic work seems to be taking. On this basis, the decision was taken at the last BMVA executive committee meeting to attempt to formalise a list of BMVA members and research interests as a reference for such events as IPOT. Members should look out for the questionnaire which will shortly be circulated regarding this matter.

Neil Thacker,
Sheffield Hallam University.

Silicon Systems

The one-day technical on 23rd Feb, organised by Neil Thacker, was devoted to current research into hardware systems and components for Machine Vision. A total of six presentations were given. Patrick Courtney, now at the Silicon Vision Group presented work from Sheffield University on two current designs based on commercially available components and Field Programmable Gate Arrays (FPGAs). These were an image warping circuit, which can perform the image transformation required on two stereo images to allow stereo pair matching, and an image correlation circuit, which can be used for tracking, optic flow and corner estimation applications.

Ian Jalowiecki from Brunel University described the Associative String Processor (ASP). His talk focussed on the development of a range of ASP systems. The basic ASP processor is implemented in a very large scale integrated (VLSI) circuit, and early versions used a number of these devices together. The next stage was to have been a larger system, in which several of the original VLSI devices would be combined together in a multi-chip module (MCM), to allow a higher level of integration. However, due to a number of technological difficulties the MCM was overtaken by a new version of the VLSI circuit, which contained all of the functionality of the MCM on a single IC. The next stage in the development of ASP is a wafer-scale implementation, WASP.

Jim Austin from the Advanced Computer Architecture Group at the University of York described the advanced distributed associative memory (ADAM), which is a cellular neural network processor, implemented in hardware. A detailed description of the operation of ADAM was given, and its use in image processing was illustrated with an application which matches air-borne imagery to standard ordnance survey map databases. This is done with a number of techniques involving the ADAM, including segmenting urban and non-urban regions of the image, and also by detecting roads and extracting the road network from the image. The ADAM can be used at different spatial resolutions, in a hierarchical manner, to reduce search time for a particular feature.

Trevor Clarkson from King's College London gave a talk on the probabilistic RAM (pRAM). This is another implementation of neural networks in hardware. It uses stochastic spike trains to model the real-valued signals transmitted between neurons in the network, and is analogous to the way in which signals are transmitted in biological nervous systems. Dr Clarkson described a VLSI implementation of the pRAM which integrates 256 neurons onto one chip,

and allows devices to be interconnected in a mesh to form arbitrarily large arrays.

Rob Yates from the Silicon Systems Group at the University of Sheffield presented two designs for general purpose image processing tasks. One device, a SIMD array of 256 processing elements (PEs), called the digital image processor (DIP), targets convolution type operations, which account for approximately 80to control the operation of the SIMD array, and to handle video input and output in such a way that the SIMD array is continually supplied with data. The other device is a sub-pixel interpolation chip for image warping operations. This should be able to handle the remaining 20processing tasks that cannot be performed using convolution.

Finally Adrian Johnstone from Royal Holloway and Bedford New College spoke in some detail about the apparent lack of uptake in the academic community of the European initiatives to develop VLSI design expertise. He described the ECAD and Eurochip programmes, in which low cost design tools and free silicon is made available to academic institutions. He then went on to describe a VLSI design project for a Sobel edge detector which demonstrated the ease with which such projects can be undertaken by students.

In summary it was very interesting to attend a meeting devoted solely to hardware issues. All of the work being presented is now making heavy use of FPGA technology, while several of the presentations showed that advanced VLSI designs are now being realised.

Bill Smith,
DRA Malvern.

Robot Guidance

On 13th April a technical meeting on "robot guidance" was held at the British Institute of Radiology. The meeting was organised by Roberto Cipolla, and was well attended. Two of the six talks dealt with hand-eye coordination issues, while the other four dealt more or less with vehicle navigation issues.

The first talk was "Uncalibrated Stereo Vision for Robot Control and Grasp Planning" given by Nick Hollinghurst of Cambridge. Hollinghurst described the goal of his work as "reliable grasping of unmodelled objects in an unstructured environment." Instead of using the "look-and-move" approach (requiring highly calibrated cameras and robot motions of high accuracy and reproducibility), his work has focussed on a technique using visual feedback. The technique consists of tracking the gripper using an affine template consisting of test points with no linking curve. Once this tracking is implemented, an error signal representing the distance between the top centre of the object (selected manually at this stage) and the "centre" of the gripper is easily computed. This error signal is fed into a gain matrix (low gain for stability) which produces movement commands for the gripper. This method is extremely robust and insensitive to changes in camera parameters since as long as the commands produced by the original gain matrix drive the gripper in a manner which reduces the error signal, that signal will still be nulled. At present, the grasp itself follows a preset strategy, but future efforts will work to generalise this method.

Next was Mike Taylor of Oxford speaking on "Grasping the Apparent Contour." This is a general non model based method of finding suitable grasps of three-dimensional objects using a parallel gripper. As Taylor explained, it is relatively simple to find the best antipodal grasp on a two-dimensional object if the camera axis is normal to the plane containing the object. This is done by finding all pairs of points with a common tangent and evaluating which pair is the most statically stable. In the three-dimensional case such measurements yield only apparent antipodal pairs. The best ones are found and the relative depths of the contact points are calculated. The pair with the smallest depth disparity is chosen and the local gradients are evaluated. With this information it can be determined in which direction to move the gripper to drive the depth disparity to zero. Because these are local calculations it is possible that with an irregular object this motion will result in a poorer grasp. Current work is directed toward finding some global shape descriptors to deal with this situation.

The third talk was delivered by Professor John Mayhew of the AIVRU at the University of Sheffield. The title of the talk was "Adaptive Control of a Four Degree of Freedom Stereo Head." Professor Mayhew started by announcing he is a big fan of camera calibration, which may be why he questioned both Nick Hollinghurst and Paul Beardsley as to the true nature of their "uncalibrated" schemes. The major point of Professor Mayhew's talk was the notion of avoiding explicit path planning through the use of a simple steering law and a desired docking orientation (effectively a boundary condition). He demonstrated results of a vehicle that was shown "docking points" (spots marked on the floor by shining a torch) and given arbitrary docking orientations for these points. The vehicle did find the points and arrive at all of

them with the correct orientation.

"ALV Guidance in the Presence of Static and Moving Obstacles" was the next talk given by Stephen Smith of DRA Chertsey. Smith started by talking about structure from motion with "Droid". Droid matches corners to determine three-dimensional structure and assumes no world motion and excellent camera calibration. From Droid he has moved onto ALTRUISM (Automatic Local Three-dimensional Representation Using Image-based Scene Measurement). ALTRUISM takes the three-dimensional output from Droid and fits a complex road model to the data. Once the drivable area is segmented, a steering angle is determined by a weighted average of the radius of the visible drivable area. Finally, Smith described ASSET II (A Scene Segmenter Establishing Tracking). ASSET II can segment multiple moving objects from a moving background and is tolerant of partial occlusion of the tracked objects.

Fifth to speak was Paul Beardsley of Oxford with "Path Planning using Affine Structure from Motion." Paul talked about a system that performs path planning using affine structure from motion. Since the affine approximation is usually used for small viewing angles of scenes far from the camera, it might seem strange to use it for navigation, which by definition requires proximity to the observed objects. In this method, however, perspective images are used to develop an affine structure through special camera movements. The affine structure's principal advantage over Euclidean structure is that none of the camera's parameters require explicit calibration. Once corners are found and matched the affine structure is computed and "free space" is found. At present, the final stage (determining whether the camera will fit through an observed gap) does require knowledge of camera width and ego-motion and does in fact compute a Euclidean measurement. Since the affine transformation preserves ratios of distances, however, the biggest gap (not necessarily big enough, though) can be found without any ego-motion or knowledge of camera parameters.

The final talk of the day was "Using and Measuring First Order Flow for Visual Navigation" by David Young of the Department of Cognitive Science at the University of Sussex." First order optic flow consists of four components. These are dilation, rotation, and two components of shear (or a shear magnitude and angle). These components can be measured from a series of images, but do they give useful information about the three-dimensional world? According to Young, five structure from motion parameters are related to the four components and if one is known, the others can be calculated (up to a fourfold ambiguity). These five parameters are point immediacy, plane immediacy, transverse direction, surface tilt, and spin about the camera axis. In answer to the rhetorical question "is this useful?", Young showed optic flow patterns applied to images and a convincing sense of three dimensional movement was produced. This perception implies that humans, at least, do find first order optic flow useful in gleaning information about the world.

Jason Heuring,
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Integrated Machine Vision

A New SERC/EPSRC Programme for Collaborative Research

The Systems Architectures Committee (SAC) of the SERC approved a directed programme of research entitled Integrated Machine Vision (IMV) in December 1993. This will be carried out in collaboration with industry, and will improve the take-up by industry of recent academic research results. Research Council funding totalling 2M pounds will be available for the academic partners, but no funding will be provided for industry.

The aim of the IMV programme is to improve collaboration between academic research and industrial users of machine vision. The strategy will be for potential end-user industries to identify closely defined goals and provide "applications pull" to exploit fundamental research results. Particular emphasis is placed on quantitative analysis of algorithms in the context of realistic applications. Projects will normally be expected to lead to prototype demonstrations of practical significance in a specific application field for machine vision.

Current Status

A launch workshop was held in February 1994, at which discussion papers were presented identifying suitable application areas for IMV. A tentative date for a call for proposals was announced at the launch workshop. However, in part as a result of the restructuring of the research councils, the issuing of the final call for proposals and the announcement of

the submission date have been delayed. It is currently expected that the submission date will be late September; it will be announced officially as soon as possible.

For further information, please contact (note new telephone numbers):

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Geoff Sullivan,
Reading University.

BMVA Teaching Initiative

The BMVA is currently addressing the needs and requirements of the teaching of Machine Vision in the Higher Educational Establishments in the United Kingdom. Elements of Machine Vision are taught over a diverse range of degree and higher degree courses, ranging from Computer Science through Electrical Engineering, Physics, Biomedical Sciences, Psychology, Geography etc. The aim of the initiative is to identify the principal needs of the Educational community, determine how these needs are currently being met, and to investigate appropriate roles for the BMVA to support Machine Vision Teaching.

The first step in this initiative has been to conduct a survey of taught courses in Machine Vision. This survey has been distributed widely to Higher Educational Institutes and through the BMVA Mailshots. The results of this survey will be published in a future Newsletter, and will also be made available via anonymous FTP from `peipa.essex.ac.uk`.

Plans are also afoot to organise a workshop on the teaching of Machine Vision at which the results of the survey will be presented. The workshop will also be used to examine existing software packages (e.g. khoros, AVS, Visilog) and to share experience of using these software for tutorial demonstration purposes, and consider the availability (or lack) of appropriate exemplar images on which to evaluate the operation and performance of algorithms.

Thirdly, the BMVA is involved in the organisation of a summer school, sponsored by the SERC, in order to provide a focussed introduction to advanced techniques in Machine Vision to first year postgraduate research students. This summer school, currently planned to be run at Surrey University during 1994, will be freely available to SERC sponsored research students and available to others for a modest charge. Further details of this summer school will be available through notices in forthcoming BMVA news letters. Finally, the BMVA committee is also involved in organising the writing of a set of lecture notes on a range of topics in Image Processing and Machine Vision. It is intended that these notes may finally be published (under the BMVA press) when a sufficient number of modules have been written. The main idea of the notes is to develop a set of basic core modules for teaching vision, which would be associated with approximately 2hrs worth of direct teaching and encapsulated in an approximately 20 page single spaced A4 document. The document would normally be divided into three sections comprising approximately five pages of introduction, ten pages of in depth material, and five pages of advanced or research based material. In addition it would be anticipated that further modules based on more advanced topics could be added to the basic core set. Modules currently under development include: Image Formation, the Human Visual System, Motion Based Analysis, Morphology and Binary Shape Analysis, the Hough transform.

Tim Ellis,
BMVA Teaching Initiative Working Party.

The Image Understanding Environment

ARPA is currently funding the development of a common environment for Image Understanding research called the IUE. The IUE is based on an object-oriented class hierarchy and is being implemented in CLOS and C++. The requirement specification is being established by a committee of ten IU researchers from around the USA, consisting of Joe Mundy (chair), Tom Binford, Charlie Kohl, Bob Haralick, Al Hanson, Daryl Lawton, Doug Morgan, Terry Boult, Keith Price and Tom Strat.

The goal of the IUE is to produce a general-purpose environment for image understanding research with standard data-structures for: images, image features, 3D geometry, spatial indices, sensors, user interfaces and graphics. An initial specification ($>$ 500 pages) has been produced, along with some

prototype code and a contractor has been selected by ARPA - Amerinex AI in Amherst MA. ARPA has recently defined an international review board to oversee the general progress of the IUE. Current members of the review board are: Olivier Faugeras, Mike Brady, Ralph Johnson, Eric Grimson and Kim Boyer.

The current ARPA project will continue for 3 years, and is intended to produce an initial core version of the environment, to be freely distributed at minimal cost to university, government and industrial labs which (it is expected) will subsequently contribute to further evolution of the IUE. It is planned that: (i) a "basic" system, including base classes, a data exchange format, and user's manual will be available internally to IUE developers in November 1994; (ii) the class hierarchies will then be completed by November 1995, at which point ARPA will enforce its adoption by its own IU contractors; (iii) the final stage will be to generate examples of applications, and tidy up for public release in November 1996.

The initial IUE specification document is available by ftp from: `peipa.essex.ac.uk` in `ipa/iue`.

Joint European workshop

A meeting of the IUE group was arranged on Jan. 24/25th, at the University of Nice (Sophia-Antipolis), to discuss the potential for collaboration between the European Vision Society (EVS) and ARPA over the IUE. The EVS represents the interests of many research groups throughout Europe, and has close involvement with Esprit DG III, which was also represented at the workshop.

The reaction of the European participants was very positive. The problems the IUE set out to address were felt just as acutely in Europe as the US. Several areas of possible omission were identified, which were felt to be particular interests of European researchers. Such areas would provide good opportunities for the Europeans to participate actively in the development of the IUE, if funding can be found (e.g. from Esprit).

There was significant nervousness about the possibility of becoming committed to free (Public Domain) software that was outside of our control, and which might later be updated commercially. (This was dubbed the "Trojan horse" anxiety; Joe Mundy observed in private, that since the IUE was the product of a committee, a "Trojan camel" might be a more appropriate metaphor!)

The meeting received assurances that the IUE was always intended to be public. Commercial "add-ons' would be expected, but the core material (the definitions of the data-structures), around which research would standardise, would remain permanently in the public domain. It was likely that some continuing support would be needed to maintain the software class libraries; this could be done through some form of low-cost subscription, akin to the funding of a scientific journal.

Latest News

A European IUE committee, chaired by Olivier Faugeras (INRIA) has been formed under the banner of ECVNET and the EVS. Members have the responsibility to:

1. make a personal evaluation of the specifications,
2. disseminate the information in his research group, University, country and convince other professionals to look at it,
3. collect feedback from his national groups,
4. write a summary of his evaluation, including suggestions for improvements and/or changes and additions.

The BMVA proposes to provide the British involvement on the committee, through Bernard Buxton (Chairman) and Geoff Sullivan (Company Secretary). Either representative would greatly welcome comments on the IUE from BMVA members (or other interested bodies) for transmission to the European IUE committee, which is expected to have its first meeting at ECCV94 (Stockholm).

**** Watch this space for further news. ****

Geoff Sullivan.

INSPEC Topics Service for BMVA Members

The BMVA and the Institution of Electrical Engineers have negotiated an INSPEC "Topics" service that is specially tailored to meet the interests of BMVA members. Topics is an abstracting service which is distributed fortnightly to subscribers. The BMVA Topics covers *Computer Vision, Motion Estimation, Pattern Recognition, Character Recognition, Feature Extraction*, and *Image Recognition*. Each listed article contains the following pieces of information:

- article title
- names of the authors
- affiliation of the first author
- full bibliographic reference
- language of the article (if not English)
- British library shelf number
- abstract (in English)
- number of references (if non-zero)

The cost of the service is 143 pounds per annum. Members may subscribe for April–December 1994 for 3/4 of this amount, 107 pounds. To subscribe, you should write to

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Michael Faraday House
Six Hills Way
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Herts
SG1 2AY

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Adrian F. Clark,
BMVA Secretary.

BMVA Technical Activities

The following meetings are currently scheduled to take place later in 1994; they will be held at the Association's usual venue which is the British Institute of Radiology at 36 Portland Place, London.

- 12th May 94 *Personal Identification.*
- 8th Jun. 94 *Tracking and Data Fusion.*
- 19th Oct. 94 *Natural and Machine Vision.*
- 16th Nov. 94 *More of Adaway's Unsolved Problems* (note the change of date).

The date and venue for the next British Machine Vision Conference is as follows:

- 13-16 September 1994 *BMVC'94, York University*

For further information about the BMVA meetings programme contact

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