BMVA News

The Newsletter of the British Machine Vision Association and Society for Pattern Recognition Volume 7 Number 2 October 1996

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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 20th January 1997.

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Editorial

W e can all breathe a sigh of relief now that most $^{\prime}$ of the conferences are over – at least for a little while. During BMVC96 I heard a lot of discussion on the relative merits of the various recent conferences, and Geoff West gives his opinion on the subject in this issue. The floor is now open for debate! The conference is also the occasion for the BMVA's Annual Open Meeting, and a (lengthy) report from the officers is included so that you (the members) can see (or at least read about) how your money was spent. In addition to BMVC I have reports on some of the multitude of technical meetings that are run under the auspices of the BMVA and IEE, with several more in the offing for next issue. On a sad note, it was at BMVC96 that many of you will have heard for the first time of Geoff Sullivan's untimely death. We start this issue with a remembrance from his long standing colleague Keith Sullivan and his brother Jim Sullivan.

Obituary – Professor Geoff Sullivan

G eoff Sullivan, BA, MSc, Professor of Computational Vision at the University of Reading, died on 23rd August 1996, aged 52. He was born on 26 January, 1944.

After graduating in Mathematics from Pembroke College, Oxford, in 1965, he moved to the University of Sussex to do research in Experimental Psychology. Here he gained a foundation in the physiology and psychology of visual perception, which, added to his mathematical training, enabled him to bring a broad insight to the field of computational vision.

¹The British Machine Vision Association and Society for Pattern Recognition is a Company limited by guarantee, No. 2543446, registered in England and Wales. Registered Office: Granta Lodge, 71 Graham Road, Malvern, WR14 2JS. The Association is a non-profitmaking body and is registered as charity No. 1002307. See http://peipa.essex.ac.uk/bmva/ for more information about the BMVA.



In 1978 whilst still at Sussex Geoff joined the research group lead by Professor Keith Baker which at that time was working in the field of intelligent systems and included work in image processing. The direction of image processing aspect of the Groups work moved in the years that followed more strongly towards computer vision influenced by Geoff's keen interest in exploration of the mechanisms of human vision.

The Alvey Vision Committee lead to the formation of the British Machine Vision Association (BMVA) of which Geoff was a founding member, later to become the Secretary of the organisation. Under the auspices of the BMVA his annual one day scientific meeting to explore the intersection of human and machine vision became a favourite event in the calendar of many researchers working in this interdisciplinary field.

Geoff moved with the group from Sussex to Plymouth and later to the University of Reading. After a period as a Principal Research Fellow he was, in 1990, appointed to a Readership in Computational Vision. In October 1995 he was promoted to a Personal Chair carrying the title Professor of Computational Vision.

The strength of the long term partnership between Geoff and Keith is reflected in the wide range of research contracts won by them as the Group grew in strength. Perhaps the most notable work and that for which the Group is best known stems from the work on model-based vision. The origin of this work can be traced directly to Geoff's great knowledge of human vision and the influence this had on the development of the algorithms used in recognising objects in natural scenes.

More recently Geoff has been instrumental in the formation of research policy as a member of the SERC Systems Architecture Committee. He was keen to see wider application of machine vision and on behalf of this Committee formulated the Integrated Machine Vision programme. It was followed earlier this year by a successful strategic workshop convened by the BMVA entitled "Images at Work" to explore priorities for new research in image processing and machine vision expected to have significant commercial impact in the next fifteen to twenty years.

At the time of his death Geoff was, with Professor Horace Barlow, FRS and Professor Richard Gregory, FRS, in the process of organising a Discussion Meeting on Knowledge Based Vision to take place at the Royal Society in London on the 12/13 February 1997. Sadly this meeting will now take place without Geoff but will be dedicated to his memory.

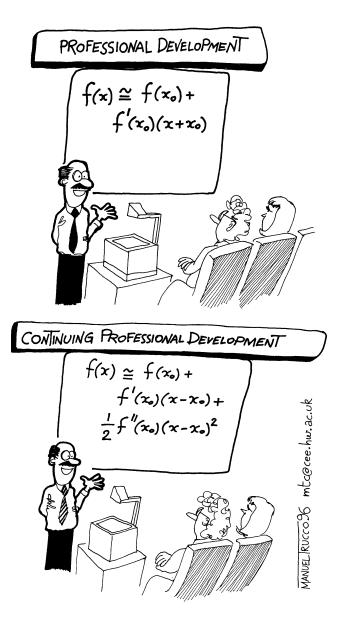
Throughout his distinguished career, Geoff retained a romantic ideal of science as the search for knowledge and truth. He was an inspiring teacher of undergraduate and graduate students, encouraging and challenging them to exceed their own expectations. Geoff gave much to his subject and to the vision research community both nationally and internationally.

In the little time he spared from scholarship, Geoff was an early music enthusiast, an interest which began during his years at Sussex, where he made and learned to play his own viols. He found great delight playing in early music consorts and hill walking with his family and friends.

Geoff is survived by his wife Sallie, whom he met while they were at Oxford, their son Daniel and daughter Ioni.

Should we bother with continuous professional development?

I t is almost a cliché to say that the pace of progress is faster than ever before, yet we are reminded of it every day – not least by the rapid growth of the Internet plague. Machine vision is in much the same boat, with today's algorithms and hardware capable of far more than many might have thought possible even a decade ago. With such relentless progress in our own and in related subjects, how can we get sufficient information to live our professional or even our private lives? More important, how can we retrain ourselves so that we are sure we fully understand the latest developments? Academics are in an interesting situation, in that they are essentially paid to keep up with the subject, so presumably they do



not need further formal education (though there are those who would seriously question this, especially over careers of 30-40 years!). However, industrial and other workers normally have little time to devote to further studies, and it is in their interests to fight to go on advanced (re-)training courses. Furthermore, enlightened employers will understand the situation, but may be very constrained in what they can do about it. Thus there is some mileage in trying to get additional training in whatever increments one can, while working on the job. The problem, of course, is making this additional training coherent and integrative over significant spans of time.

In answer to this problem, the IEE has instituted a scheme which allows its members to pick up training points during their everyday activities. If you go to an evening class, you get one or two training points; if you attend a 1-day meeting, you get a few more training points; if you attend a conference you may get a fair number of training points. Indeed, the scheme is quite imaginative: for example, active participation results in more training points than passive participation, so giving a conference paper may earn you as many points as an afternoon meeting.

The intrinsic problem with such schemes is the amount of red tape that is involved to earn minimal numbers of training points. However, the IEE (and IMechE, for this is already a combined scheme) has reduced the amount of red tape to reasonable levels. It even trusts bodies called *accredited providers* to allocate training points as they see fit, so long as they complete one easily understood form for each training slot.

You will be pleased to hear that soon after the IEE/IMechE training point scheme (actually called a "Continuous Professional Development" or CPD scheme) came into being about two years ago, the BMVA saw fit to get itself registered as an *accredited providers*. Thus it is that most BMVA technical meetings, and all of its annual conferences, are registered to allocate CPD points.

By way of example, our recent highly successful annual conference, BMVC'96, was allocated 9 CPD points; its 1-day Tutorial was allocated 2 CPD points; while the "Low Level Feature Extraction" meeting, organised by Dr. Paul Rosin for 16 October, will have earned members 3 CPD points.

Now that the scheme has caught on, and increasing numbers of our members are wishing to be awarded CPD points, we feel it is right to publicise more widely our position as an *accredited providers*. As Meetings Officer of the BMVA, I am also the Registered CPD Contact for the BMVA, and I would like to hear any comments you wish to make about the scheme. If you need more information about CPD, the IEE and IMechE have produced a revised version of their booklet "Engineering Success: Continuing Professional Development" which explains the situation quite clearly. The booklet is available from Ruth Hughes of the IEE at:

> Institution of Electrical Engineers Michael Faraday House Six Hills Way Stevenage, Herts, SG1 2AY tel: 01438 767290 fax: 01438 313465

and queries about the scheme should be addressed to her. I should also mention that she has written a shorter more chatty account, and this appears in the 5 September 1996 IEE News, no. 116, p. 20.

Before closing, I would draw your attention to three things you should do if you wish to obtain CPD points relating to any of our meetings:

- 1. You should be registered on the IEE scheme in advance of the meeting.
- 2. You should make sure you sign our own register for attendance at the meeting.
- 3. You should make sure you have paid the relevant fee for the meeting.

The IEE reserves the right to make spot checks with the BMVA on either of the latter two items.

Professor E.R. Davies Meetings Officer email: E.R.Davies@rhbnc.ac.uk

Colloquium on Industrial Inspection

The IEE E4 Group on Image Processing and Vision will be running a Colloquium on Monday 10 February 1997 at Savoy Place, London (organisers: Prof. Roy Davies and Dr. Ray Thomas).

The purpose of the meeting will be to air and discuss issues, methods and the latest techniques which may be applied to the inspection of products during manufacture, with the aim of guaranteeing/improving quality control. To this end papers will be presented on automated visual inspection and related topics, such as the appropriate application of X-ray and ultrasound technology. It is expected that a component of review and overview will be included in the session, and that the papers chosen will present an integrated coverage of the subject, though sufficient variety will be maintained to emphasise the breadth of the subject and the up-and-coming areas that are in need of further attention.

Prospective authors should submit an extended abstract (≈ 1000 words) describing their contribution by 10 November 1996 to either of the organisers, at:

> Professor E.R. Davies Royal Holloway, University of London tel: +44 (0)1784 443497 email: E.R.Davies@rhbnc.ac.uk

Dr. R. Thomas University of Brighton tel: 01273 642200 email: R.Thomas@bton.ac.uk

ICPR-96 and BMVC-96: Compared and contrasted

 \mathbf{W} ell, the conference season is in full cry and I now feel a little shell shocked having attended ICPR-96 in Vienna and BMVC-96 in Edinburgh. Instead of reviewing each conference separately, it is interesting to compare and contrast ICPR and BMVC as they were only separated by one week and have a large overlap in content. This is important for researchers such as myself because of the cost and inconvenience of travelling from places such as Australia. ICPR is large (700+ papers, 900+ delegates), has parallel sessions and most people stay in hotels. BMVC is small (70 + papers, 150 + delegates), has a single track and everyone stays in a hall of residence. Both conferences were well organised and the question I would like to consider is which of these two formats is the best. Unfortunately this seems to depend largely on the objectives of the organisers and delegates. Having lived abroad for the last six years, it appears to me that large conferences such as ICPR satisfy the paper writer's objective of getting as many publications as possible for career development. This fits in nicely with the organisers' objectives which is to make some profit (and especially not a loss) which seems to require as many attendees as possible. Unfortunately quality then seems to suffer and becomes a secondary issue which flies, some people would argue, in the face of scientific advancement. I must state that I contributed to this as I had three papers at ICPR! Compare this with BMVC where all the presentations and papers were of high quality, well presented, and, being single track, attended by the majority of delegates. A telling sign is the attendance on the last day. At ICPR, the sessions were poorly attended whereas at BMVC, the last session (even the last paper) was well attended. So 'the take home message' is 'small is better' perhaps.

Another problem with conferences the size of ICPR is the volume and weight of the proceedings. The ICPR proceedings weighed 8.8kgs. and the organisers went to the extent of organising a discounted courier service to ship them anywhere in the world from the conference venue. CDRom is obviously needed here although contractual arrangements with the IEEE make producing a CDRom difficult as they require an indexed version and not simply a dump of the postscript files! Of course the BMVC proceedings were smaller and more compact and also came with a free CDRom which I know took only a couple of weeks for Tim Ellis to produce (see elsewhere for details of how to get the CDRom and the proceedings to BMVC-96).

Okay now for the technical content. At ICPR there were, as expected, a very broad range of topics grouped into four parallel sessions: Computer Vision, Pattern Recognition, Applications and Robotic Systems, and Parallel and Connectionist Systems with 11 invited talks spread across the four streams. Apart from the usual papers on feature extraction, motion, stereo and pattern recognition, there was evidence of the influence of more commercially oriented applications such as digital libraries, multimedia and surveillance. Of interest to me was the notion of appearance based recognition with a number of papers on view generation by interpolation of images. These inexact representations or the real world are thought adequate for many applications such as virtual reality.

Onto BMVC where there were two invited speakers. J.-O. Eklundh from Sweden discussed issues in active vision and A. Bobick from the Media Lab. at MIT who was more concerned with analysing action in video sequences. It is interesting to compare the two talks. The first investigating the classic approaches of motion and stereo analysis (using an active vision scenario) while the second used more radical ideas such as low resolution, differenced and binary images. Both talks were stimulating and thought provoking as evidenced by the post talk discussions. The rest of the conference covered advances since the last BMVC with big contributions from Manchester, Surrey and Cambridge. Note that most if not all the vision community in the UK was represented. All the talks I went to (and I went to nearly all of them) were well attended, well presented and had good discussions afterwards.

One of the highlights of BMVC's small industrial exhibit was an automatic face model acquisition system demonstrated by the Turing Institute, which was used to acquire face models from 65 of the delegates. (After the conference they put up the models in VRML on their WWW site. Even my distinguished face was there!)

Both conferences had poster sessions which I find can be very informative allowing an author to be questioned in depth. However whereas BMVC had about 50% of papers as posters, ICPR had something like 66% or double the number of oral presentations. This I felt was too much as it was difficult to cover all the posters in the time allowed.

This review is timely as with the increased use of the Web for publishing, the question of whether conferences are worth attending has to be asked. I would say that conferences of the quality of BMVC are well worth attending. You get to see all the presentations, meet the authors, and the quality is kept high. Sadly ICPR is not in the same league. The papers may be of similar quality but the size prevents it functioning as a conference in the true sense of the word.

> Dr Geoff West School of Computing, Curtin University of Technology, Perth Western Australia email: geoff@cs.curtin.edu.au

IEE Colloquium on Digital Mammography

 \mathbf{T} he high incidence of breast cancer and the fact that mammography is the most effective radiological technique for its early detection has led to widespread and broad-based research into computerbased inspection and analysis of mammograms.

In order to address some of the important issues raised by this problem, Professional Group E4 (Image processing and vision) of the Institution of Electrical Engineers organised a Colloquium in March 1996 to bring together researchers from across the spectrum of current activity in the application of image processing and vision techniques to mammographic analysis. The aim was to cover topics ranging from the imaging process itself, through the detection of specific features of diagnostic relevance and the evaluation of automated processing, to the effective implementation of algorithms for automated mammogram analysis.

In the event we were able to offer an excellent crosssection of papers and to attract an audience representing interests from clinical practice, University research and industry. We were most fortunate in being able to welcome two Keynote speakers from the USA, Dr Matthew Freedman from the Georgetown University Medical Centre and Dr. Patrick Coffield from the US Air Force Wright Laboratory. The Colloquium also included papers from the Kent and Canterbury Hospitals NHS Trust dealing with fundamental issues concerning the National Breast Screening Programme and imaging standards, and papers from a number of UK Universities covering diverse topics including new ideas on imaging techniques, wavelet based compression of mammographic images, and statistical methods, deformable contours and a variety of abnormality detection models for mammographic analysis, while a representative from the Fischer Imaging Corporation in the USA brought an industrial dimension to the programme.

It was most encouraging that almost all the University-based presentations involved collaboration with clinical establishments or industrial partners, and the programme as a whole proved enormously interesting, informative and valuable for those present.

> Prof. Mike Fairhurst, (Colloquium Co-Chairman) Electronic Engineering Laboratory, University of Kent, email: M.C.Fairhurst@ukc.ac.uk

BMVA Annual Open Meeting

The Annual Open Meeting of the Association was held on Tuesday 10 September in Pollock Halls, Edinburgh at 8:00 p.m.. It was attended by about 25 members of the Association and received reports from the Chairman, Meetings Secretary and Secretary. The following notes represent the Chairmans feeble memory of what was reported, augmented by reports from the Meetings Secretary and Treasurer plus some comments that could not be disclosed at the time i.e. venue for BMVC97, etc.

Chairman's report

Conferences

During the year the Association had been host to the European Conference on Computer Vision, ECCV. This was held in Cambridge during April and was chaired and co-organised by Prof Bernard Buxton and Roberto Cipolla. Traditionally, the meeting presents high quality papers and this year was no exception. The excellent technical sessions were complemented by cultural activities of a high order. It was clear that the status of the UK vision community as a major force in vision had been enhanced by having the conference in the UK. Both Roberto and Bernard are to be congratulated for their hard work. A slight negative aspect to the event was the fact that it was not yet clear whether the conference would be a financial success. Regrettably, the high quality accommodation which was booked at Robinson College had not been taken up in the anticipated numbers and the conference may be liable for significant penalty charges. The matter was currently under negotiation and its outcome would be clear in next years accounts.

The Chairman then went on to report the latest status regarding bidding for the International Conference on Pattern Recognition, ICPR. The Association had once again taken part in the bidding process which is held once every two years. However, it was anticipated that there would be a strong preference for the conference to travel to the USA as it has not been held there for nearly a decade. Consequently, BMVA put in place only an expression of interest rather than a full bid. The purpose of this was to indicate our continued interest and to prime IAPR that we would put forward a fuller, more serious bid in two years time. As fate would have it, two full bids were received: one from Washington State, USA and one from Barcelona in Spain. Bob Haralick, a leading IAPR member, prepared the Washington bid and was thought to be the odds-on favourite. However, much to our surprise, the Spanish crept up on the inside rail and on a vote of the Governing Body, managed to secure the race for ICPR2000. While those who favour a federal Europe must applaud this decision, it does mean that the likelihood of getting ICPR to our island shores before 2004 (or 2006) has diminished.

The final conference event of the year was the current BMVC in Edinburgh. Early indications were that it was well attended, had attracted a tranche of good papers and was being enjoyed by all. Organisation had proceeded smoothly under the astute chairmanship of Bob Fisher and both he and his team are to be heartily thanked for their stirling efforts.

The venue for BMVC97 was not disclosed at the Open Meeting. During the year the Chairman solicited expressions of interest via BMVA News from all those willing to host a BMVC. Two venues had emerged as serious contenders: Essex University and the University of Wales at Bangor. Both sites were able to offer excellent facilities and the final deliberations provoked much discussion, especially as the conference has yet to visit Wales. However, the greater mass and more established nature of image related activities finally decided the issue in favour of Essex and therefore BMVC97 will be held in Colchester under the Chairmanship of Adrian Clark.

Educational Activities

The association continues to hold regular one-day technical meetings on topics of interest to its members. These events are summarised in greater detail in the report from Roy Davies, the Meetings Secretary.

Education once more figured large in BMVA activities both via the holding of a second EPSRC sponsored Summer School in Computer Vision and via the results of the education survey collated by Tim Ellis. The summer school was finally held during the summer i.e. at the end of June rather than the Easter date of the previous year. It was attended by 35, mainly first year, PhD students and the programme of events was largely unchanged from the previous year. A major administrative hickup was averted by rescheduling the Special Dinner to an earlier time to avoid a direct clash with the EURO96 semi-final between England and West Germany. Apart from the disappointment associated with the matches penalty shoot-out, the school again succeeded in motivating and enthusing the students and it is hoped that EP-SRC will once again sponsor it in 1997.

On the teaching survey front Tim Ellis has written a short article in a previous BMVA News summarising the findings of his survey. It is clear that there is much teaching activity in the area and a diverse range of material is used. For some time the Association has planned a modular series of short teaching monographs but in practice lack of time has precluded the preparation of the material. In addition, the publishing situation is being influenced increasingly by the multi-media and web explosion and therefore the Committee are now re-evaluating the best way to address the obvious demand for products in the sector. One conspicuous developer of computer based teaching material is Bob Fisher via his Hypermedia Image Processing Reference, HIPR, pages (you can navigate to it on the WEB via the BMVA sponsored PEIPA archive site at Essex). As a result of attending Committee meetings, as current chair of BMVC, Bob has kindly agreed to champion the review of teaching activities and it is hoped to make significant progress over the coming year. He will be helped in this by a small working party, including Chris Taylor who has just completed a term as Chair of the IAPR Education Committee and therefore brings a world wide perspective on the teaching of computer vision, image processing and pattern recognition.

Membership Benefits

The Chairman reminded the audience of the considerable, and often under-subscribed, benefits of joining BMVC. These include free attendance of one day technical meetings, mailshots, two newsletters (BM-VANews and the IAPR Newsletter), reduced attendance rates at BMVC and IAPR sponsored conferences, reduced subscription rates for several journals and magazines (Pattern Recognition Letters, Machine Vision Applications, Image Processing magazine) and travel and student bursaries to enable young researchers to attend conferences.

Research Funding

BMVA has continued to be influential in promoting machine vision research and ensuring that it has a high profile with funding agencies. The Integrated Machine Vision programme, which was largely framed by BMVA members, is now online with about 10 projects active. In addition, Chris Taylor has managed to promote the need for development of a common Image Understanding Environment, IUE, and has received funding for Manchester to act as a UK hub site. A round of proposals for sites to act as spokes with responsibility to provide code in designated algorithm areas has been issued and proposals have been evaluated. At the time of the Open Meeting results of the evaluation were not publicly available but projects should be funded to start later in the year.

At last years Annual Open meeting the need for a consultative mechanism whereby we could propose research programmes to EPSRC was highlighted. During February this was addressed by the holding a strategic workshop to consider research opportunities in machine vision and image processing. The workshop was organised for BMVA by Geoff Sullivan and was attended by 20 industrialists and 10 academics, including several from the BMVA Committee. The workshop took as one of its starting points the output of the Governments Foresight exercise. Discussions took place over two days and resulted in a report "Images at Work". The key recommendations were the establishment of a club activity to bring research and industry together and the suggestion of about half a dozen research areas which were regarded as both generic research themes and of long term relevance to UK Plc. The report is currently being circulated as widely (or wildly) as possible and comments are invited from the whole vision and image processing community. Anyone who has not yet received a copy of the report can obtain one by writing to Dr James Anderson, Department of Computer Science, University of Reading, Reading RG6 6AY. The questionnaire which is included with the report can also be returned in the first instance to James. The BMVA will then discuss and amend recommendations and look for ways to progress in collaboration with both EPSRC, DTI (both of whom provided some sponsorship for the workshop) and other interested parties.

John Illingworth Chairman

Meetings Secretary Report

For a variety of reasons, there have been slightly fewer of the usual technical meetings during the year, though those that have taken place have been highly successful. Indeed all have had high attendance – in several cases in excess of 60. It must also be remembered that the Association has put more than usual effort into conferences, ECCV'96 having been organised by BMVA Committee members as well as BMVC'96.

The 1-day technical meetings that took place during the year were:

2 Nov. 1995 "Document Image Processing and Multimedia Environments", at the IEE (in collaboration with IEE Professional Group E4)

6 Dec. 1995 "Robust Statistics and Robust Vision", at the BIR (in collaboration with the RSS)

6 March 1996 "Colour in Machine Vision", at the BIR (in collaboration with the Colour Group)

19 April 1996 "Computer Vision in Man-Machine Interfaces", at Cambridge University

29 May 1996 "High-order Statistics", at the Royal Statistical Society (in collaboration with the RSS)

It is clear that some of the success of these meetings arose from the collaborations with other Societies, and led to significantly increased participation. However, collaboration does not automatically lead to success, and where this happens it is the result of good communication and hard work from the coorganisers of both Societies.

In the coming year, several interesting meetings are planned, including the following:

16 Oct. 1996 "Low Level Feature Extraction", at the BIR, organiser: Paul Rosin

11 Dec. 1996 "Model Building for Vision", at the BIR, organiser: John Illingworth

15 Jan. 1997 "New Approaches to Dynamic Filtering", at the BIR, organiser: Steve Maybank

with a meeting on Medical Image Interpretation in the period March-June 1997, organiser: Chris Taylor.

The first of these meetings is now fully prepared and imminent. For the other three meetings, prospective speakers should approach the organisers as soon as possible.

Roy Davies Meetings Officer

Treasurers Report

Reviewing the BMVA accounts for the last financial year, January - December 1995, shows that the Association income and expenditures were largely in line with the previous year. A small operating loss of \pounds 700 was made, primarily as a result of a small decrease in income generated. The major items of expenditure continue to be associated with the one-day technical meetings and the regular mailshots. Overall, the Association finances are very healthy with good reserves in the bank.

A new feature introduced during the year was a credit card payment facility and this will be available in future for use in payment of meeting fees or for items such as copies of the BMVC proceedings.

Anyone requiring further information of the accounts should contact the Association Treasurer, Dr Margaret Varga.

Margaret Varga Treasurer