

BMVA News

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

Volume 25 Number 4
June 2015



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<http://www.bmva.org/>

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 10 September 2015.

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Editorial: *How Afraid Should We Be of Robots?*

Some famous scientists have expressed fears about future robot domination of the human race – amongst them Stephen Hawking, Elon Musk and Bill Gates. Admittedly, they were talking about times many decades into the future. One thought is that we will have to stand over robots in true Magna Carta style and force them to sign pledges, based on Asimov's three laws of robotics. However, I have tended to be very sceptical about all this, as what we really need to do to solve such problems is simply to pull the plug. Nevertheless, I eagerly read the details of the recent DARPA Robotics Challenge, in which robots were given a number of fairly simple tasks. These included (1) driving a vehicle about 75 m past some obstacles; (2) egressing the vehicle; (3) opening a narrow door and walking sideways through it; (4) opening a valve about 20 cm across; (5) making a sizeable hole in a wall using a power drill; (6) sticking a plug into an outlet; (7) clearing rubble from the walkway; and (8) climbing a short flight of stairs. The winning robot would be the one that completed these tasks in the shortest time, including time added for penalties.

All very straightforward you might think, not least as we are now many decades past the invention and huge widespread use of computers *and* the use of robots to assemble cars, mow lawns, vacuum the house and perform countless other tasks. Indeed, initial progress, viz., driving the vehicle, seemed to be mostly successful (arguably because it is nowadays de rigeur given the attention that has been paid to robot vision and automatic driving). However, many of the robots fell over both when egressing the vehicle and when climbing the stairs, some damaging themselves in the process and others having to be helped to their feet by humans and then rebooted. Indeed, falling over seemed to be the rule rather than the exception, even occurring as the robots tried to walk through the door, or raise their arms in success at the end of the challenge! Another failure was that of robots dropping the drill they were using to make a hole in the wall, giving up and having to move on to the next task.

Small wonder then that I went back to my hobby of comparing robots with humans: and the little girl Eva I

¹ The 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-profit-making body and is registered as charity No. 1002307.

mentioned a year ago as having mastered 3D vision at five months, who has now completely solved the problems of balancing and getting up after a fall, opening a good many doors (at least those whose handles she can reach), climbing stairs in both adult and crawling modes, though admittedly not yet driving, using power drills or inserting plugs into sockets (in the latter case only because she is not given the chance!). Clearly, the DARPA robots only have a mental age of about 18 months – though I seriously doubt whether it is even that, as they will largely have been programmed using code written by humans rather than solely from training through habituation to life (i.e., starting with crawling and the other ways by which a baby learns).

Looking again at the way children learn, they actually progress in stages, and at different rates. Some learn to speak early on, others much later. (Note the apocryphal story of a famous person who when asked why he hadn't spoken up to the age of five, announced it was because "the arrangements have hitherto been entirely satisfactory"). It turns out that Eva has so far repeated only a handful of words, as if her speech input and output channels are closed off, sufficient information arriving from vision and tactile sensing, the last year having been spent solely (it seems) in mastering the mechanics of moving, and also of gripping, feeding herself with a spoon in either hand, and above all learning to manipulate objects. So at 17 months she is ahead of the robot in not dropping the implements she is using.

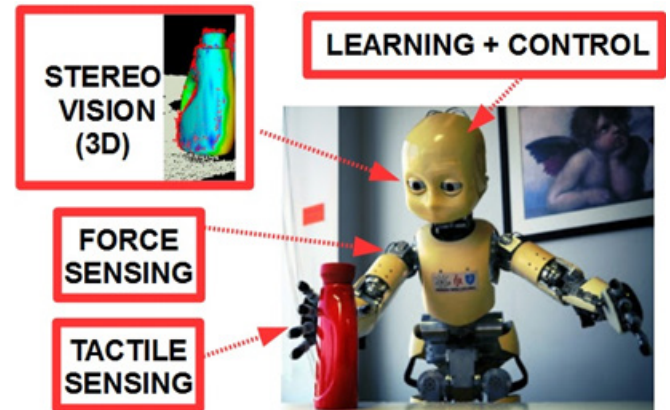
What then are the lessons to be learnt from all this? For humans, vision and tactile sensing come first; then motion and manipulation (both of which require mechanisms to be handled, and visualised, in many dimensions); then speech, as later on that is the means by which we learn far more – i.e., we learn not just from our own efforts and mistakes but from the knowledge and actions of others. And why learn speech too soon when it will interfere with the other two skills and when it requires far greater concentration to progress it? Thus it appears that robots need to learn more in the manner of babies when they are young, training themselves not to fall over, and learning to manipulate their tools by similar processes – which with young people we call 'play'. Actually, I don't know that children are ever really playing: rather they are exploring possibilities and learning for themselves. This amounts to training themselves, while robots are only trained by human operators feeding them with the right sort of data: they are far from training themselves. I don't know if I am being unfair on some robot builders, and if so I apologise. But at least I feel I have revealed some of the reasons (a) why the DARPA challenge robots fell over, both literally and metaphorically, and (b) why in the modern day and age robots are still not able to take over in dire situations such as the Fukushima power station disaster, exploring, managing the situation and eliminating problems. In short, they would doubtless be falling over on the job, thereby becoming part of the problem rather than part of the solution.

Overall, I think I have answered the question about how afraid we should be of robots. As posed, the answer is not at all: at present they have a mental age of at most 18 months. However, this points to another question: how safe are we likely to be in cars driven by them? Well, would you want to be driven around by a child of 18 months? And how likely are robots to drop something heavy on you in a house or factory? How well will they be able to anticipate problems such as tripping and pouring tea all over you when trying to

serve you? For human recognition of everyday objects and obstacles is well honed and based on a huge database of largely visual knowledge that children of less than 18 months effortlessly train themselves to deal with.

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BMVA Workshop on Visual, Tactile and Force Sensing for Robot Manipulation



This one-day BMVA symposium will be held in London on Wednesday 9 December 2015.

Chairs: Lorenzo Jamone and Serena Ivaldi

Keynote speakers: Kaspar Althoefer (King's College London), Jeremy Wyatt (University of Birmingham), Bruno Siciliano (University of Naples Federico II, Italy).

Call for contributions:

We invite contributions to the workshop in the form of a one-page abstract, to be submitted via email to ljamone@isr.ist.utl.pt (please insert the [BMVA meeting] tag in the subject), by 22 July 2015.

Topic

Robotic manipulation has received considerable attention in the last decades, as witnessed by a large number of international projects (e.g., Handle, Grasp, DARPA's ARM, Poeticon) and scientific publications. Robots can perform repetitive tasks with high speed and accuracy in industrial settings (e.g., car manufacturing). However, their applications in semi-structured environments are still very limited due to their poor adaptation capabilities: examples are situations in which accurate object models cannot be obtained (e.g., food, fabrics), or in which complex manipulation is required (e.g., electronics assembly). Most of the state-of-the-art solutions for robotic manipulation rely on vision more than tactile/force sensing, and only a few integrate different sensory modalities. While both technologies can be improved in isolation, it is their combined use that can have a tremendous impact on the manipulation skills of robots. Indeed, multisensory integration is fundamental to achieve robot autonomy and

robustness: visual, proprioceptive, tactile and force sensing must be considered together, and fused in an optimal way that allows taking the best control decisions.

The workshop will bring together researchers that are investigating data-driven strategies for learning and control of robotic manipulation, as well as specialists from academia and industry that are working on the development of novel sensing technologies that are relevant for grasping and manipulation, e.g., 2D and 3D vision, depth sensors, soft tactile sensors, compliant force sensing.

The workshop will consist in a mixture of oral presentations, poster/interactive sessions and/or live demonstrations, and a final panel discussion.

Topics of interest include but are not limited to:

- 3D object reconstruction
- object segmentation/recognition/classification
- visual attention for object exploration and manipulation
- new tactile/force sensors technologies
- sensors and robot automatic calibration
- haptic exploration of rigid and compliant objects
- multimodal object exploration and representation
- data fusion techniques
- hierarchical sensory representations
- motor primitives for sensor-based grasping and manipulation
- grasping and in-hand manipulation of non-modelled objects
- teleoperation for complex manipulation
- dynamic simulation of robotic hands with tactile/force sensors models
- challenges in learning from high-dimensional, multimodal sensor data
- combined visual and tactile/force sensing for manipulation control.

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BMVA Workshop on Context Aware Cognitive Systems

This one-day meeting will be held at the British Computer Society, London on 17 July 2015. For details see:

www.bmva.org/meetings

Chairs: Nicolas Pugeault, Sinan Kalkan, Frank Guerin and Angelo Cangelosi

Keynote speakers: Professor Kenny Coventry (UEA), Professor David Hogg (Leeds), Dr Walterio Mayol-Cuevas (Bristol), Dr Ben Tatler (Dundee), Professor Florentin Woergoetter (Goettingen, Germany)

Programme

- 9.25 Welcome and introduction
9.30 Keynote 1: Learning to recognise objects in context.
David Hogg

- 10.20 PROforma: a proven language for formalising tasks in context aware agents. John Fox
10.40 Exploring the benefits of a rich context for robot actuation. Martin F Stoelen, Fabio Bonsignorio and Angelo Cangelosi
11.00 Coffee break
11.20 Keynote 2: Language, space and context. Kenny Coventry
12.10 Lunch
13.00 Keynote 3: Actions and objects: a grammatical view. Florentin Worgotter
13.50 Context-aware multi-robot system. Stanislaw Ambroszkiewicz
13.10 Towards modeling context on a humanoid robot. Hande Celikkanat, Güner Orhan, Nicolas Pugeault, Frank Guerin, Erol Sahin and Sinan Kalkan
14.30 Keynote 4: Context and attention (Title TBC). Ben Tatler
15.20 Coffee break
15.40 Keynote 5: Contextual mapping (Title TBC). Walterio Mayol-Cuevas
16.30 Presentation of the US Air Force lab funding program – US Air Force
17.00 Open problems for using context in robotics. Frank Guerin, John Alexander
17.20 Conclusion and move to Salieri Restaurant for dinner
17.30 Optional bookable dinner at Salieri (ending ~19.30)

Registration

Book online at www.bmva.org/meetings
£10 for BMVA Members
£30 for Non Members
(These prices include lunch.)

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The BMVA Thesis Archive

If you've taken a look at the BMVA website recently, you'll see that there are quite a few doctoral theses there. The BMVA is happy to archive and make available any such theses as a service to the research community, the only requirement being that the thesis was written at a UK university.

If you're a student, please consider contributing your thesis to the archive; and if you are a supervisor, there is no better way of advertising your suitability as a supervisor than your students' theses! The information we need is not onerous; for details, see:

<http://www.bmva.org/theses:top>

Finally, note that theses do not have to be contributed immediately after the examination; we recently added one to the archive a decade after it was examined.

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BMVC 2015 – Call for Participation



7–10 September 2015, Swansea
<http://bmvc2015.swan.ac.uk>
 Twitter: @bmvc2015
 Registration Open

Introduction

The British Machine Vision Conference (BMVC) is one of the major international conferences on computer vision and related areas. It is organised by the British Machine Vision Association (BMVA).

The 26th BMVC will be held at Swansea University Singleton Campus on 7–10 September. The Singleton Campus is set in rolling parkland overlooking the majestic sweep of Swansea Bay, the start of the famously dramatic Gower coastline comprised of twenty-one bays and coves.

BMVC 2015 is a high quality single-track conference, comprising oral presentations and poster sessions (with oral acceptance <10% in the last 6 years). The conference features two keynote presentations and a conference tutorial, and has five associated workshops on the last day of the conference, including a PhD student workshop.

BMVC 2015 attracted 553 valid submissions, a new record for BMVC. The reviewer pool was significantly expanded prior to the paper submission deadline in an effort to substantially reduce the average review load. Conference registration is now open:

<http://bmvc2015.swan.ac.uk/?services=registration-open>

Conference tutorial

BMVC 2015 features a half-day conference tutorial on 7 September. The tutorial is particularly beneficial to research students and early career researchers who are working in this field. We are honoured, with Chris Bishop, to have such a prominent researcher in the field of pattern recognition and machine learning to deliver the tutorial.

Professor Christopher Bishop

Chris Bishop has a BA in Physics with First Class Honours from Oxford, and a PhD in Theoretical Physics from the University of Edinburgh with a thesis on quantum field theory supervised by David Wallace and Peter Higgs. In 1998 he joined the Microsoft Research Laboratory in Cambridge where he became Deputy Managing Director, and later the Chief Research Scientist. He is a Partner in Microsoft, and is head of the Machine Learning and Perception group. In 2010 he was awarded the accolade of Distinguished Scientist, representing the highest level of research distinction within Microsoft, and was the first person in Europe to hold this title. At the same time as he joined Microsoft Research, he was elected to a Chair of Computer Science at the University of Edinburgh where he is a member of the Institute for Adaptive and Neural

Computation in the School of Informatics. He is also a Fellow of Darwin College, Cambridge. He has been elected Fellow of the Royal Academy of Engineering, and Fellow of the Royal Society of Edinburgh, and has been awarded two Honorary DSc degrees. His research interests include probabilistic approaches to machine learning, as well as their applications in industry, commerce, and healthcare.

Keynote speakers

BMVC invites two leading researchers in the field to present their work at the conference. We are grateful to the following speakers who have agreed to give keynote lectures at the conference.

Professor Ron Kimmel

Ron Kimmel is a Professor of Computer Science at the Technion where he holds the Montreal Chair in Sciences. He held a post-doctoral position at UC Berkeley and a visiting professorship at Stanford University. He has worked in various areas of image and shape analysis in computer vision, image processing, and computer graphics. Kimmel's interest in recent years has been non-rigid shape processing and analysis, medical imaging and computational biometry, numerical optimisation of problems with a geometric flavour, and applications of metric geometry and differential geometry. Kimmel is an IEEE Fellow for his contributions to image processing and non-rigid shape analysis. He is an author of two books, an editor of one, and an author of numerous articles. He is the founder of the Geometric Image Processing Laboratory and a founder and advisor of several successful image processing and analysis companies.

Professor Kristen Grauman

Kristen Grauman is an Associate Professor in the Department of Computer Science at the University of Texas at Austin. Her research in computer vision and machine learning focuses on visual search and object recognition. Before joining UT-Austin in 2007, she received her PhD in the EECS department at MIT, in the Computer Science and Artificial Intelligence Laboratory. She is an Alfred P Sloan Research Fellow and Microsoft Research New Faculty Fellow, a recipient of NSF CAREER and ONR Young Investigator awards, the Regents' Outstanding Teaching Award from the University of Texas System in 2012, the PAMI Young Researcher Award in 2013, the 2013 Computers and Thought Award from the International Joint Conference on Artificial Intelligence, and a Presidential Early Career Award for Scientists and Engineers (PECASE) in 2013. She and her collaborators were recognised with the CVPR Best Student Paper Award in 2008 for their work on hashing algorithms for large-scale image retrieval, and the Marr Best Paper Prize at ICCV in 2011 for their work on modelling relative visual attributes.

Important dates

Early registration until:	Friday 24 July
Late registration until:	Friday 7 August
Workshop deadlines:	see below
Conference tutorial:	Monday 7 September
Main conference:	Tuesday–Thursday, 8–10 Sept
Conference Workshops:	pm on Thursday 10 September.

Registration

BMVC 2015 offers a number of access options: full access, day access, tutorial access, and workshop access. The full access option covers the complete conference programme, including tutorial, workshops, and social activities (reception and banquet). Both residential and non-residential registrations are available for the full access option, with optional pre- and post-conference accommodation (subject to availability). For full details and online registration go to:

<http://bmvc2015.swan.ac.uk/?services=registration-open>

Full Access	early	late
Residential: [†]	£505.00	£565.00
Non-residential:	£380.00	£440.00
Non-residential, on-site:	£500.00	
<i>Other Access</i>	<i>by 7 Aug</i>	<i>after 7 Aug</i>
Tutorial only:	£100.00	£120.00
Workshop only:	£80.00	£100.00
One-day access:	£180.00	£200.00

Extra Banquet ticket (subject to availability):	£55.00
Extra Reception ticket (subject to availability):	£35.00
Extra accommodation: Sunday (6 Sept), Thursday (10 Sept) and Friday (11 Sept):	£45.00 [‡]

[†]Residential registration includes B&B for Monday–Wednesday.

[‡]per person per night – subject to availability

Workshops

BMVC 2015 is pleased to announce that the following five workshops will be included in the conference programme. All workshops are scheduled at pm on Thursday 10 September. Workshops are free for all attendees registered to the main conference. However, workshop authors must register to the workshop event (regardless of main conference registration status).

WP-1 Machine Vision of Animals and their Behaviour

Chairs: Telmo Amaral, Stephen Matthews, and Thomas Plötz, Newcastle University; Stephen McKenna, University of Dundee; Robert Fisher, University of Edinburgh

Keynote speakers: Professor Ilias Kyriazakis, Newcastle University (Professor of Animal Health); Professor Robert Fisher, University of Edinburgh (Professor of Computer Vision)

Submission deadline: 10 July 2015

Website: <http://di.ncl.ac.uk/mvab2015>

WP-2 Differential Geometry in Computer Vision for Analysis of Shapes, Images and Trajectories

Chairs: Hassen Drira, Institut Mines-Telecom/TELECOM Lille, France; Sebastian Kurtke, Ohio State University, USA; Pavan Turaga, Arizona State University, USA

Keynote speaker:

Dr Anuj Srivastava, Distinguished Research Professor, Department of Statistics, Florida State University, Tallahassee, USA

Submission deadline: 4 July 2015

Website: <http://www-rech.telecom-lille.fr/diff-cv2015/>

WP-3 Advances in Breast Imaging

Chairs: Harry Strange, Reyer Zwiggelaar, Aberystwyth University; Moi Hoon Yap, Manchester Metropolitan University

Keynote speakers:

Two invited speakers to be announced.

Submission deadline: 10 July 2015

Website: <http://users.aber.ac.uk/hgs08/ABI2015/>

WP-4 Computer Vision Problems in Plant Phenotyping

Chairs: Sotirios Tsafaris, IMT Lucca, Italy and Northwestern University, USA; Hanno Scharr, Forschungszentrum Jülich, Germany; Tony Pridmore, University of Nottingham

Keynote speaker:

Professor Tim Cootes (University of Manchester)

Submission deadline: 24 June 2015

Website: <http://www.plant-phenotyping.org/CVPPP2015>

WP-5 Computer Vision Student Workshop

Chair: Gary KL Tam, Swansea University

Keynote speaker:

Professor Mark Nixon (University of Southampton)

Submission deadline: 13 July 2015

Website: <http://bmvc2015.swan.ac.uk/?p=2227>



Conference chairs

Xianghua Xie, Swansea University
Mark Jones, Swansea University
Gary Tam, Swansea University

Dr Xianghua Xie
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BMVA Distinguished Fellow 2016 – Call for Nominations

The BMVA Executive Committee seeks nominations for the *Distinguished Fellow 2016* award. This prestigious award is given to one person only each year in recognition to his/her services to the British Machine Vision community. The nominees must be distinguished researchers, based in the UK, who have contributed significantly to the field of research and the reputation of the British Machine Vision Community both nationally and internationally. Nominations, *with a few lines of rationale*, should be sent to Professor Roy Davies, Chair of the Distinguished Fellow Award Panel, by 1 September 2015.

Professor Roy Davies
Chair, Distinguished Fellow Award Panel
email: e.r.davies@rhul.ac.uk

The Computational Face – Automatic Face Analysis and Synthesis

This one-day BMVA symposium will be held in London on Wednesday 14 October 2015. For details see: www.bmva.org/meetings

Chairs: Brais Martinez, Yorgos Tzimiropoulos and Michel Valstar

Keynote speakers: Tim Cootes (University of Manchester), Darren Cosker (University of Bath), Maja Pantic (Imperial College London, TBC), Richard Bowden (University of Surrey, TBC), Gregor Hofer (Speech Graphics Ltd, TBC)

Call for contributions

The programme will feature a number of invited speakers, and a number of talks by interested parties. In addition, there will be a poster session for interested parties. If you would like to give a talk or bring a poster, please contact Brais Martinez (brais.martinez@nottingham.ac.uk) by 1 July.

Topic

The face is one of the most important means of social interaction for the human species, and it is therefore no surprise that Automatic Face Analysis and Synthesis are increasingly active topics in computer vision and graphics. Face analysis encompasses AI tasks such as the automatic detection of face presence and location, face alignment, facial expression recognition, face recognition, age and gender estimation, and even determination of perceived beauty. Work on face synthesis includes the realistic rendering of faces, blending one face into another, face animation (either markerless or driven by tracked markers), and aspects such as expression transfer. Together, Automatic Face Analysis and Synthesis can be thought of as the Computational Face.

In this meeting we hope to seek the opinions of speakers from the most interesting companies and academic labs with an interest in the computational face on the future of Face Analysis and Synthesis. What academic challenges remain? What elements are ready for adoption by industry? What are the key factors blocking progress? What new application opportunities can be envisaged?

Areas of interest covered by this meeting include:

- 2D/3D facial expression analysis and expression transfer
- Face biometrics
- Face and facial point detection/tracking
- Avatar face animation
- Demographics estimation from the face
- Real-time face rendering
- 3D face reconstruction
- Visual speech synthesis

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Report on ISBI 2015

This year, the 12th IEEE International Symposium on Biomedical Imaging (ISBI) was held in the bustling city of New York. Hosted at the Marriott at Brooklyn Bridge on 16-19 April, ISBI 2015 showcased a range of techniques including 3D reconstruction and registration, deep learning, segmentation, shape analysis and much more. There were a total of 714 submissions, of which 130 were scheduled for oral presentations, 251 for poster and 9 for special sessions. With a range of attendees from industry and academia, there were interesting discussions and plenty of opportunity to collaborate with experts in the medical field.

The conference hosted a total of 8 challenges which took place on the first day of the conference. I attended the first contest on “Automatic Polyp Detection Challenge in Colonoscopy Videos” which showed some innovative ideas for segmenting polyps using closed contours and CNNs. Congratulations to the winning team from the Machine Vision Group in Barcelona, who tackled the challenge by eliminating distracting artefacts such as specular highlights and black masks before applying level sets to segment polyps. I look forward to the progression of this contest in following years.

It was exciting to see a large number of presentations and posters successfully applying deep learning techniques in the medical domain. Very early in the conference Bram van Ginneken started this trend by showing the application of features extracted from a pretrained CNN, OverFeat, for nodule detection in CT images. In the “Deep Learning” track session on Friday, a range of applications were showcased from optic disk segmentation in retinal imaging to characterisation of healthy skin in high-resolution OCT imaging. There was a buzz around deep learning throughout the conference and I expect to see more applications of CNNs in the next few years.

In terms of my research in histopathology, posters presented by Nasir Rajpoot, Roman Stoklasa and Renuka Shenoy revealed novel techniques using superpixels to capture complex patterns in 2D cell images. Shahab Ensafi showed an innovative sparse dictionary learning technique to classify cells in immunofluorescence imaging. In the “Histological Imaging” poster session, Jonas Pichat and Pekka Ruusuvoori used 2D sequential histology slices to build 3D histopathology models enabling richer understanding of cell biology. Jun Kong showed early work in cell segmentation in 3D microscopy imaging. With more medical advances, I anticipate we will see more 3D applications in this field in the future.

Keynote presentations scheduled throughout the conference were both informative and inspiring. Jennifer Lippincott-Schwartz talked about new discoveries in superresolution microscopy, showing discoveries emerging from beautiful 3D cell images.² Ellen Grant showcased tailor-made scanners for young children, highlighting the importance of advancing medicine for the minority of the population. For me, the highlight of the conference was an inspiring presentation by the Nobel Prize winner Martin Chalfie, giving some insight into the reality of the modern scientist. Describing his work in green fluorescence protein (GFP), Martin highlighted the importance of collaborative

²https://embs.papercept.net/conferences/conferences/ISBI15/program/ISBI15_ContentListWeb_2.html#FrKN1

efforts, accidental discoveries and freedom to explore new, or indeed old, ideas – a fantastic way to round off another year of fruitful discussions.

I would like to congratulate the organisers of ISBI 2015. Given the beautiful weather, the Marriott was an excellent place to host the conference. The Welcome reception was stunning with amazing food and great company, offering a great opportunity to network. I would also like to thank BMVA for funding me to attend the conference. It was a fantastic experience and offers great incentive for early career researchers to showcase their talent.

Next year, ISBI will be returning in Prague, Czech Republic, at the Clarion Hotel. More details can be found on the website:

<http://biomedicalimaging.org/2016/>

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Review of BMVA Technical Meeting: Vision for Human–Computer Interaction and Virtual Reality Systems

This one-day BMVA Symposium was held in London on Wednesday 6 May 2015.

The chair, Manuela Chessa (University of Genoa, Italy), opened the BMVA meeting at 10 am on 6 May by welcoming speakers and attendees. She introduced the main motivation of the BMVA meeting titled “Vision for human-computer interaction and virtual reality systems”. The meeting was dedicated to the integration of two important topics in the development of human-computer interaction systems based on virtual reality (VR). On one hand, the meeting addressed the investigation and development of Computer Vision techniques for the detection, tracking and analysis of human body pose and movement. In conjunction with such technological development, scientific investigators must study the perceptual issues that may arise with the use of VR systems.

Following the introduction, the first keynote speaker, Guido Maiello from University College London, opened the morning session dedicated to psychologists and to the study of visual perception in (stereoscopic) virtual reality. Guido Maiello’s talk, titled “Depth Perception and Binocular Vision in Naturalistic Virtual Reality”, focused on the importance of investigating and monitoring eye movements in virtual reality settings. The speaker also introduced a gaze-contingent depth-of-field display and demonstrated how such a display, as well as other virtual reality techniques, can be employed to modify binocular eye movements.

Focus cues for VR applications were further discussed in the excellent talk given by Dr Simon Watt of Bangor University, titled “Presenting natural focus cues in virtual/augmented reality”. The speaker eloquently outlined the vergence–accommodation mismatch and its consequences for immersion in VR. Dr Watt went on to describe the merits and drawbacks of several solutions

which have been proposed in the literature to properly simulate accommodation: from software solutions to volumetric and fixed-viewpoint displays, ending with light-field displays. The speaker concluded that presenting natural focus cues is worthwhile and that future displays will certainly render approximately correct focus cues, yet the vision science community must provide a more thorough understanding of how the visual system employs focus cues in order to build generalizable models to predict how novel displays will perform.

To conclude the morning session Dr Paul Hibbard from the University of Essex discussed ways to quantitatively define the quality of simulated 3D environments. He proposed that the optimal solution is task dependent. For each VR application, developers and experimenters must determine the best trade-off among appearance, performance and experience, since maximizing any of these three metrics will often lead to a decrease in the others.

The afternoon session of the meeting, dedicated to Computer Vision topics, commenced following the lunch break. The second keynote speaker Dr Tae-Kyun Kim from Imperial College London opened the afternoon session. Dr Kim gave a talk titled “Articulated hand pose estimation by decision forests”, in which he presented a detailed overview on the latest techniques for hand action/gesture recognition via random forest classification algorithms.

The following presenter, Victoria Bloom from Kingston University, described a method for real-time human action recognition. The action recognition system outlined by the speaker was developed to perform online detection of multiple complex actions from multiple users, which is an essential requirement of natural user interfaces.

Muhammad Asad of City University London presented a talk titled “Hand pose and orientation estimation for ego-centric devices”. The work was motivated by the fact that the diffusion of mobile and wearable devices requires the development of novel interaction methods.

Following these three technically challenging talks, a coffee break allowed meeting attendees to assimilate and discuss the presented content.

The meeting commenced once again with a talk by Professor Francesca Odone from the University of Genoa. Professor Odone presented joint work with colleagues from both the University of Genoa and from the Italian Institute of Technology on “Understanding human motion and its qualities”. The presentation was well received as it discussed biological motion perception from the perspective of cognitive science with a computer vision approach. Specifically the multi-centre research team of which Professor Odone is part is applying computational models to understand the cognitive processes underlying biological motion perception. Their findings are integrated into a robotic system, the iCub, which is designed, among other uses, to study how human perceptual development can be applied to humanoid robotic systems.

The following speaker, Dr Nicoletta Noceti from the University of Genoa, presented “Good practices of hand gestures recognition for the design of customized NUI”. The talk focused on a dynamic gesture recognition method for Natural User Interfaces, i.e., in all interfaces where a user may employ arms and hands to perform dynamic gestures in front of a camera to direct a system’s behaviour. To demonstrate the robustness of the method, Dr Noceti

presented a photo browsing system as an example application.

The final talk of the meeting, titled “You-Do, I-Learn: unsupervised multi-user egocentric approach towards video-based guidance”, was given by Dr Dima Damen of the University of Bristol. She presented an approach for discovering task relevant objects and their common modes of interaction from multi-user egocentric video. The fully automated method compares appearance, position and motion features of objects within a scene and combines these features with gaze fixations as proxies for attention. Once a task relevant object is identified, the system provides the user with a video guide on how the object is to be used. Following her presentation Dr Damen invited meeting attendees to test a working prototype of her developed system implemented on Google glasses.

The meeting officially ended at 5 pm, but scientific discussion continued both in the hallways of the BCS building and at dinner engagements among meeting attendees. Overall, the meeting was well received, highly productive, and concluded with the potential of interesting collaborations to be commenced in the future.

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Dundee Medical Image Analysis Workshop

Medical image analysis is firmly at the centre of clinical practice and research. This offers simultaneously opportunities and challenges to our community. The former are the many possibilities to make a real difference in terms of better diagnosis, more efficient procedures, more effective treatments, and the discovery of biomarkers for high-prevalence conditions, to cite only a few. The latter include the complex nature of medical images, the difficulty of taking advantage of the image formation process for the analysis, the limited interaction with clinical specialists, the time-consuming nature of generating gold-standard annotations, how to translate results effectively, forming sufficiently large research consortia to produce meaningful results technically and clinically, and managing and exploiting the huge volume of data (not only image data, incidentally) being generated daily in hospitals. It comes as no surprise that the medical image analysis and medical informatics communities have been growing steadily, and with them the number of journals and conferences disseminating their research.

The challenges are many, but they must be read as, again, real opportunities for research. It is tempting to embrace a perhaps poetic exaggeration in saying that there has never been a better moment for research in this field, as the computational power we can access in large clusters and the cloud was unimaginable a relatively short time ago, the performance of imaging instruments is continuously getting better, and increasingly large bioresources with cross-linked data and including images are becoming available; see for instance UK Biobank.

It is against this backdrop that the SICSA “Medical Imaging and Sensing in Computing” research theme was launched, aiming to bring together like-minded researchers from across Scotland, forming a new intellectual community in which to promote their research, and foster creativity across institutions and collaborations between academia and industry. In addition, computer scientists involved in other research fields, such as machine learning, are invited to connect their relevant work to the field of medicine, sparking innovative new projects. Ultimately this theme aims to enable researchers from across Scotland at all stages of their careers to make meaningful connections with other academics and industry members, to work together to improve patients’ lives.

On 27 March 2015, a one-day workshop on Medical Image Analysis was held at the University of Dundee’s Queen Mother Building, forming part of a series of events organised in this SICSA research theme. Contributions were welcomed from anyone with an interest in medical image analysis research from whatever perspective, be it technical, clinical, or biological, with the goal of fostering discussions and collaboration between researchers in both academia and industry who work on medical image analysis or in related areas such as medical imaging, machine learning, data science, health informatics, or bioimage informatics.

With over 40 attendees from Universities across Scotland and industrial partners such as Toshiba Medical Visualization Systems Europe, the workshop consisted of a varied, high-quality program of contributed oral and poster presentations, giving a small but representative cross-section of medical image analysis research in Scotland. Topics included lung tumour segmentation, motion correction for coronary artery CT, artery/vein classification for retinal blood vessels, and hierarchical classification of skin lesions, to name but a few. We were also delighted to have two distinguished invited speakers, Professor David Wyper from SINAPSE and the University of Glasgow, discussing the role of functional imaging in the study of neurological and psychiatric disease, and Professor Giovanni Montana from King’s College London, talking about his group’s current work in medical image analysis and biostatistics.

A PDF copy of the book of abstracts produced for the event, containing abstracts for both the poster and oral presentations, may be downloaded from the workshop website:

<http://mia.computing.dundee.ac.uk>

We are grateful to SICSA for sponsoring this workshop and to David Harris-Birtill for his organisation of the SICSA Medical Imaging and Sensing in Computing Research Theme. The School of Computing, University of Dundee, also provided sponsorship, and the BMVA endorsed the meeting. Thanks are also due to support staff in the School of Computing for their continual assistance. And finally, of course, our thanks go to the many contributors of high quality oral and poster submissions, which ensured a highly informative and successful day for everyone involved.

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Travel Bursaries for International Conference Attendance

The BMVA provides a number of travel bursaries for student members of the BMVA who are research students at UK institutions to present their work at significant international conferences within the BMVA's remit. The maximum amount of a bursary is £750. In return for the bursary, students are asked to write a conference report for BMVA News – most of the conference reports you read in these august pages are from students who have received bursaries – or do some work for the BMVA. Details on eligibility and the application procedure are outlined on the BMVA website.

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CVMP 2015 – Call For Papers

The 12th European Conference on Visual Media Production (CVMP 2015) will be held at the British Film Institute (BFI), London during 24–25 November 2015.

<http://www.cvmp-conference.org/>

Full papers deadline: 6 July 2015

For over a decade CVMP has built a reputation as the prime venue for researchers to meet with practitioners in the Creative Industries: film, broadcast, games. The Conference brings together expertise in video processing, computer vision, computer graphics, animation and physical simulation. It provides a forum for presentation of the latest research and application advances, combined with keynote and invited talks on state-of-the-art industry practice.

CVMP 2015, the 12th European Conference on Visual Media Production, is an ACM published conference with the following highlights:

- Computer Vision & Graphics for the Creative Industries: Film, Broadcast and Games
- Strong attendance from Industry, VFX R&D and Academia
- Regular paper deadline: 6 July 2015
- \$2k best student paper prize!
- ACM published proceedings
- Vibrant demo and short papers programme (call to follow)
- Keynote speakers to be announced shortly!

We invite submissions of regular, technical papers presenting novel research or applications related to any aspect of media production. We particularly encourage submission of early stage doctoral work, and there is a Google/Youtube sponsored prize of 2000 US\$ for the best graduate student paper. Full length submitted papers should be no more than 10 pages long and will be subject to peer review. Accepted papers will be presented in either oral or poster form.

Papers are invited in all areas of visual media production related to film, games, and broadcast, and include but are not limited to:

- 3D video capture and 3D-TV
- Character Animation
- Computational Photography
- High-dynamic range (HDR) imaging
- Image and video synthesis
- Image enhancement and restoration
- Interactive media and games
- Motion Estimation
- Multiple camera systems
- Omni-directional video
- Post production using Stereo, 3D and motion
- Pre-visualization
- Real-time imaging systems
- Relighting images and video
- Scene modelling
- Segmentation and matting
- Video and camera tracking
- Video-based animation
- Video-based human motion capture
- Visual asset management
- Visual effects (VFX)

Further details of online submission and paper formats are available at:

<http://www.cvmp-conference.org/Call-for-Papers>

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Imaging for Crime Detection and Prevention

ICDP 2015 will be held at Queen Mary University of London during 15–17 July 2015. Important highlights are:

- Early-bird registrations extended!
- Accommodation suggestions available
- Possible funding for IEEE student authors Region 8
- Tony Porter (UK's Surveillance Cameras Commissioner), Mick Neville of Scotland Yard and Chris Mann (founder of ThroughVision) to be keynote speakers
- Tutorial on the impurity of street-scene video footage.

This conference follows the successful IDSS (Intelligent Distributed Surveillance Systems) events held in 2003 and 2004 and ICDP 2005, 2006, 2009, 2011 and 2013, to bring together researchers, industry, end-users, law-enforcing agencies and citizens' groups to share experiences and explore areas where additional research, development and better working practices are needed, identify possible collaboration and consider the societal impact of such technologies.

Two London universities (Queen Mary and Kingston) and the EU LASIE project co-sponsored by the IET, IEEE Chapters, BMVA, UKIVA and UCL are working together to organise this well-known bi-annual event.

The 6th International Conference on Imaging for Crime Detection and Prevention (ICDP 2015) aims to create an important networking forum in which participants can discuss the present and future of image-based technologies for crime detection and prevention.

ICDP (and its predecessor, IDSS) has traditionally been a special meeting point of different disciplines (computer science, social science, engineering, management, etc.) and an opportunity for a wide range of stakeholders to discuss the many different aspects of the application of imaging technologies in this socially crucial domain.

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IET International Conference on Technologies for Active and Assisted Living (TechAAL)

This conference will be held at Kingston University, London on 5 November 2015, 09:00-17:15. It is organised by the IET's Vision and Imaging Professional Network (co-sponsored by the Healthcare, Control and Automation and Robotics and Mechatronics professional networks).

http://www.theiet.org/events/2015/220728.cfm?utm_source=redirect&utm_medium=any&utm_campaign=techaal
<http://www.techaal.org>

Active and assisted living (AAL) makes “use of information and communication technologies (ICT) in a person's daily living and working environment to enable them to stay active longer, remain socially connected and live independently into old age” (<http://www.aal-europe.eu>). Research efforts in AAL have increased rapidly to support independent living, as the social and economic impact of the aging population has become a more concrete problem in our European society. The impact of the European demographic change is widely recognised, making critical the need to address the problem from both a societal and an economic standpoint. In the light of this, research into aging, age-related conditions and into supporting an aging population has become a priority for many governments around the world.

AAL aims to provide assistive solutions for people affected by a wide range of physical and cognitive challenges, in particular elderly persons. AAL applies the paradigm of the Internet of Things where sensing technology is embedded in objects or in the environment or worn on the person to promote health and enhance wellbeing, or to help maintain an independent life at home. Captured sensor data are analysed to detect activity and infer knowledge about the physical or cognitive status of a monitored person, recognising and classifying patterns, detecting trends and unusual or anomalous behaviour.

AAL systems should be intelligent, able to learn and adapt to a wide variety of needs and requirements in real-time, synchronised with the specific need and designed and implemented to pre-empt, whenever possible, accidents and incidents that might occur in an assisted environment.

Nowadays, this is a very relevant area for research and innovation. Therefore, this event will serve as an important channel to present the latest advances in this area. Being a multidisciplinary area, the event should attract researchers and professionals with different expertise: technological, health, care and social sciences, business.

Full papers are invited on all aspects of active and assistive living – from academia, industry and others – to be selected for oral presentations through a peer reviewed system. Papers should be submitted online at:

<https://easychair.org/conferences/?conf=techaal2015>

All papers will be published by the IET and indexed by INSPEC (IET Digital Library), provided that at least one author registers and presents the work.

Keynote speakers

- Malcolm Fisk, Coventry University
- Bart Vanrumste, KU Leuven

Topics of interest include but are not limited to:

- Smart homes
- Intelligent sensors
- Interaction with the smart home (wearable, gesture recognition, affective computing)
- Data fusion
- Computer vision for AAL
- Reasoning systems
- Networks and integration platform
- Assistive and social robotics

Applications

- Tele-care and tele-health
- Fall prevention, detection and intervention
- Gait analysis
- Prevention and management of chronic conditions
- Support to activities of daily living (ADL)
- Mental health and cognitive stimulation
- Indoor and outdoor mobility
- Well-being, social interaction and isolation
- AAL at work

Associated issues

- Interoperability
- Usability and accessibility
- Privacy and ethical issues

Paper submission timetable

Submission of full papers:	4 September
Notification of acceptance:	1 October
Submission of camera-ready papers:	16 October

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Report on FG 2015

The 11th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2015) was held in Ljubljana, Slovenia on 4–8 May 2015. It is one of the most important conferences on Face and Gesture Recognition. It covers a broad range of topics, such as face recognition, facial expression analysis, and gesture and action recognition. The conference presents research that advances the state-of-the-art in these and related areas, leading to new capabilities in various application domains. FG 2015 received 221 submissions and 94 papers were accepted: 27 submissions were selected for presentation in the oral track and 57 for presentation in the poster track. The conference lasted for 5 days with a main technical program, 6 workshops, 3 tutorials and 11 technical demos.



One workshop on the first day

On the first day of the conference, there was one tutorial on ‘Iris Recognition’ and 3 workshops. I mainly attended ‘Facial expression recognition and analysis challenge (FERA 2015)’ and ‘Context based affect recognition (CBAR 2015)’ workshops, which were more directly related to my PhD research. FERA asked participants to compete on AU intensity estimation on two non-posed databases, BP4D and SEMAINE. The purpose of CBAR was to bring researchers together to discuss context information for affect analysis. It was divided into 2 sessions and each session started with a keynote. The first keynote was given by Professor Roddy Cowie from Queen’s University Belfast and the second was given by Dr Louis-Philippe Morency from Carnegie Mellon University. After each keynote, two recent works on affect analysis with contextual information were presented.



Main venue of FG 2015

The main conference lasted for 3 days. Each day started with a keynote in a different research area. The first day focused on face recognition and the keynote was entitled ‘Face image processing: historical perspectives and more’ and was given by Professor Matthew Turk. The keynote was

originally planned to be given by Professor Takeo Kanade, but he could not attend the conference for health reasons. After the keynote there were two oral sessions and 9 papers were presented on face recognition. After that a poster session with 20 papers was held. Nine demos were also exhibited in the afternoon. In addition, there was a special session on ‘My research vision for the next 10 years’. Three researchers gave talks about ‘Their 10-year research vision’ from different perspectives on face analysis, language recognition and prosopagnosic computer. The first main conference day ended with an impressive welcome reception.

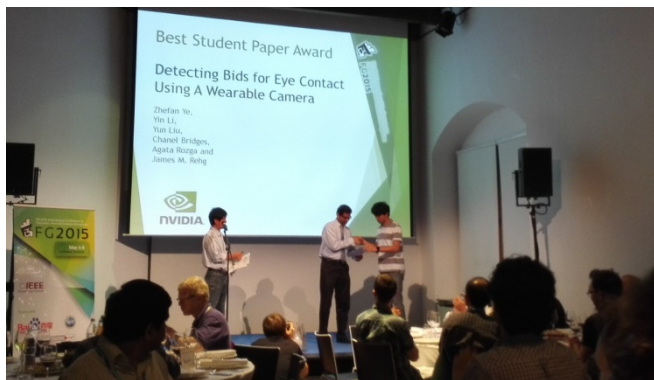


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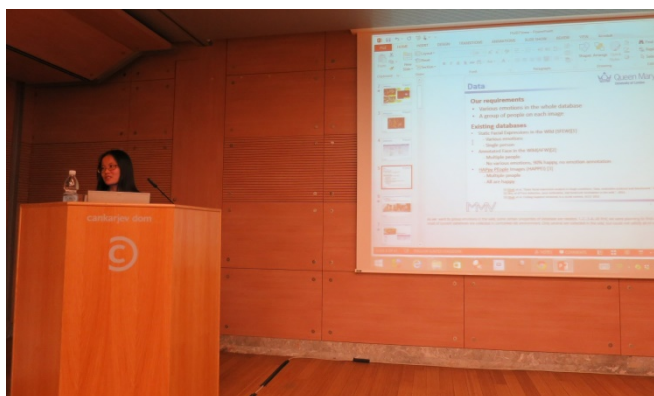
Poster session on face recognition

The second day of the main conference focused on affective computing and facial expression analysis. As I am working on affective computing, I was really interested in that day’s topics. The second day started with Professor Ursula Hess’s talk entitled ‘The social signal value of emotion expressions: the impact of context and culture’. After the keynote, 9 papers on affective computing and facial expression analysis, and 6 recently published journals on face and gesture analysis were presented. Two poster sessions were held in the afternoon: one with 20 conference papers on affective computing and one with 11 recently published journals on face and gesture analysis. The second day of the main conference ended with a banquet and award ceremony in Ljubljana Castle. This beautiful castle was built hundreds of years ago and stands on the Castle Hill above the downtown of Ljubljana. The best paper award, the best student paper award, the test of time award and the best demo award were also announced that night. Best paper and best student paper were given to ‘Dense 3D face alignment from 2D videos in real-time’ and ‘Detecting bids for eye contact using a wearable camera’ respectively. The paper that received the best student paper award was on dyadic interactions, which is related to my current research. I talked to the first author, Zhefan Ye, about their work and their database. Apparently they are still working on extending the database, but it is already publicly available. I will try to get access to this database as it may provide me with new ideas and insight for my research.



Best student paper award

The last day of the main conference was mainly about gesture and pose recognition. But I was really interested in the keynote entitled ‘Multimodal machine learning: modelling human communication dynamics’ given by Dr Louis-Philippe Morency. He mainly talked about conditional random fields (CRFs). I talked to him during the reception explaining that I was going to work on multimodal and multiple people analysis, and he suggested that I consider CRF-based methods as well. After his keynote I got a general idea about CRFs, but I still need to go into more details if I want to use it for my research. After the keynote there were 6 oral papers and 17 poster papers, which were on gesture and pose recognition. In addition, three papers were presented in a special session on ‘Evaluation and mouth motion analysis’.



Presenting my work at EmoSPACE'15 workshop

There were 2 tutorials and 2 workshops held on the last day of the conference. I presented my work entitled ‘Group-level arousal and valence recognition from static images: face, body and context’ at the ‘Emotion representation, analysis and synthesis in continuous time and space (EmoSPACE 2015)’ workshop.

This year’s Conference on Automatic Face and Gesture Recognition was very well organized in terms of both technical program and social events. More information about FG 2015 can be found on the conference website: <http://www.fg2015.org/>. Finally, I would like to thank BMVA for providing me the generous support that enabled me to attend this conference.

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Young Researchers’ Poster Exhibition

As part of the IET International Conference on *Imaging for Crime Prevention and Detection* (ICDP 2015: see p. 9), we will be running a free-to-attend Young Researchers’ Poster Exhibition. This exhibition is open to any student currently conducting research on any Vision and Imaging topic and at any stage of their studies.

The main purpose of this event is to give young researchers an opportunity to display their work and ideas to a mixed international audience of researchers, professionals, manufacturers and end-users, in order to network, get feedback, and explore possible collaboration (e.g., for accessing real-world data).

You will have space for an A1-portrait poster and all we ask is for you to be available during the poster sessions to be held at Queen Mary University of London on 15–17 July. Should you wish, you can also register as a student delegate. Registration is via the IET website:

<http://www.theiet.org/icdp>

ICDP is organised by the IET *Vision and Imaging* Network. For details, see <http://www.theiet.org/communities>

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Call for Expressions of Interest to Host BMVC in 2017

The BMVC’s Executive Committee would like to hear from anyone interested in hosting BMVC in 2017. At this stage only an expression of interest is required; those submitting successful expressions of interest will be asked to supply an official bid to hold the conference.

For the expression of interest please supply the following details:

- Main contact for the conference: name, email and phone.
- Prospective members of the conference organising committee.
- Provisional dates for the conference along with details of accommodation and arrangements for the conference venue and meals.

BMVC is traditionally held in one of the first two weeks of September and runs as a single-track conference with podium and poster sessions from Tuesday through to Thursday lunchtime. The pre-conference Monday afternoon is normally scheduled for a tutorial session.

The main conference auditorium must be large enough to accommodate 250 delegates and should be a tiered auditorium with adequate A/V facilities. The poster room should be capable of holding 150 2m × 2m poster boards, ideally in the same contiguous space (e.g., a large hall). For further information on preparing a proposal to run BMVC please refer to:

http://www.bmva.org/w/bmvc_proposals

Please send expressions of interest to the BMVA Chair, Dr Adrian Clark, by 30 September 2015.

Adrian Clark
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