The Centre for Power Transmission and Motion Control

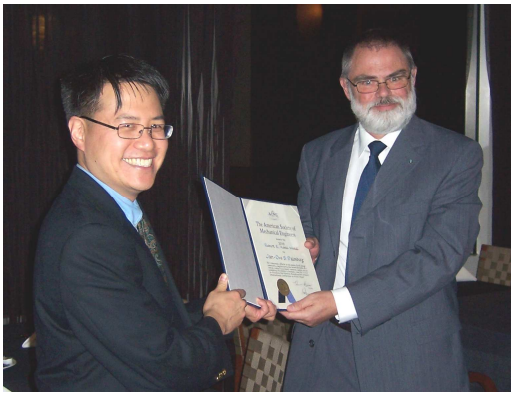
November 2009
www.bath.ac.uk/ptmc

PTMC News

The Centre for Power Transmission and Motion Control

FPMC Symposium 2009 in Hollywood

The ASME/Bath Symposium on Fluid Power and Motion Control took place on 12th to 14th October in Hollywood. This is the second year in which the FPMC Symposium has taken place jointly with the American Society of Mechanical Engineers, and the first time it has taken place in the USA. The Symposium is now a very well established event in the fluid power calendar and has been running annually since 1988. This year 42 papers were presented, the highest number yet.



Professor Palmberg (right) being presented with the 2009 Robert E Koski Medal

During the Symposium dinner the 2009 Robert E Koski Medal was presented to Professor Jan-Ove Palmberg of Linköping University, Sweden. The award was presented for 'renowned efforts in the global fluid power community, particularly the establishment of a world-class fluid power research centre at Linköping University in Sweden; and for co-founding the biennial Scandinavian International Conference on Fluid Power'. Professor Palmberg has been a long-term friend and colleague of Bath and has made a huge contribution to fluid power research, and we warmly congratulate him on his achievements.

The 2008 Best Paper Award was presented to Eric Barth of Vanderbilt University for the paper entitled "Experimental assessment of a free elastic-piston engine compressor with separated combustion chamber", co-authored with José Riofrío.

New Starters in Autumn 2009

A number of new PhD students and researchers have joined us this autumn:

Frederick Berg, supported by an EPSRC case award with EADS, is developing an aircraft energy map, which will help to understand in detail the energy flows within the complete system over an entire flight cycle.

Rebecca Margetts receives an EPSRC Case award with Airbus to look at unified aircraft mechatronic system modelling with bond graphs to develop integrated models with a common representation.

Katharine Griffiths is embarking on a joint project with the Innovative Design and Manufacturing Research Centre (IdMRC) to optimise packaging subject to vibrations during road transport.

Peichao Li is continuing the magnetic bearing research at the Centre, following Iain Cade who has left us recently. His main area will be the control and contact recovery using piezo-actuated active auxiliary bearings.

Zhenyu Du and **Jawaad Bhatti** will be working on the control of compliant and lightweight robots with adaptive stiffness capabilities.

We also welcome **Lucas Ginzinger** from the University of Technology, who is visiting us for 6 months. His area of expertise is model-based monitoring of auxiliary bearings in rotating machinery.

Dr Xiaodong Wang is with us for a year as a Visiting Researcher from Beihang University, China. His expertise is in modelling, control and hardware-in-the-loop test systems.

FPMC 2010: Call for Papers

The FPMC Symposium 2010 will be held at the University of Bath from 15-17 September. We seek original technical papers on all aspects of fluid power and motion control, in particular on system modelling and simulation, experimental studies, general control issues, efficiency, noise, contamination control, and component design.

Important dates are:

- Deadline for abstracts: *31 December 2009*
- Deadline for draft papers: *31 March 2010*
- Deadline for final papers: *30 June 2010*

We are looking forward to receiving your abstracts and papers by email:

ptmc@bath.ac.uk

In This Issue:

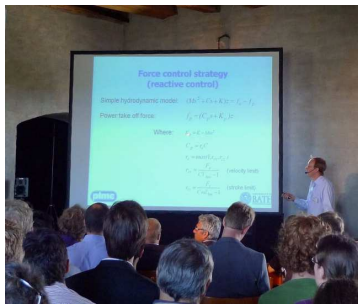
EWTEC 2009 in Sweden

After being involved in a number of wave power related consultancy projects and ongoing research in that area, Andrew Plummer and Michael Schlotter attended the 8th European Wave and Tidal Energy Conference in Uppsala, Sweden from the 7-10 September. The conference was hosted by Uppsala University. The well-known castle located very close to the town centre provided an excellent venue for the sessions.

Around 400 delegates presented their work. Andrew Plummer presented a paper about power take off performance which provoked some interest. Other sessions dealt with device development and testing, power take off control, and environmental aspects.

A major part of any conference is the social event, and EWTEC 2009 was no exception. Particularly the "open stage" after dinner where delegates could show off their talents may be something we should consider for our future FPMC symposia at Bath.

The next EWTEC will be held in Southampton in September 2011.



Andrew Plummer presenting at Uppsala

Center for Compact and Efficient Fluid Power

The Center for Compact and Efficient Fluid Power (CCEFP) is a network of researchers, educators, students and industry working together to transform the fluid power industry in the US — how it is researched, applied and studied. Center research is creating hydraulic and pneumatic technology that is compact, efficient, and effective. The CCEFP's education and outreach program is designed to transfer this knowledge to diverse audiences—students of all ages, users of fluid power and the general public.

The Centre is funded by a $17m grant from the NSF, and is also supported by its 59 industrial partners and seven participating universities, led by the University of Minnesota. Following a positive 3rd year review, the Center is hopeful of securing funding to sustain it beyond the original 5 year term.

More information can be found at *www.ccefp.org*.

Recent Publications

Abulrub AG, Sahinkaya MN, Burrows CR. October 2009. **An adaptive weighting control strategy to avoid magnetic bearing contact**. *The 2nd Annual Dynamic Systems and Control Conference*. Hollywood, CA, USA.

Wang P, Sahinkaya MN, Akehurst S. October 2009. **Pseudo-causal tracking control of a nonminimum phase system**. *The 2nd Annual Dynamic Systems and Control Conference*. Hollywood, CA, USA.

Plummer AR, Serena Guinzio P. October 2009. **Modal Control of an Electrohydrostatic Flight Simulator Motion System**. *Bath/ASME Conference of Fluid Power and Motion Control*. Hollywood, CA, USA.

Johnston DN. October 2009. **A switched inertance device for efficient control of pressure and flow**. *Bath/ASME Conference of Fluid Power and Motion Control*. Hollywood, CA, USA.

Ghorashi A, Plummer AR, Edge KA, Keogh PS. October 2009. **Accurate Decoupled Linear Modeling for Robust H-infinity Control of Multi Axis Shaking Tables**. *Bath/ASME Conference of Fluid Power and Motion Control*. Hollywood, CA, USA.

Plummer AR, Schlotter M. September 2009. **Investigating the performance of a hydraulic power take-off**. *Proceedings of the 8th European Wave and Tidal Energy Conference*, Uppsala, Sweden.

Schlotter M. September 2009. **Development of course material in a multi-author environment**. *Australasian Journal of Educational Technology*. 25(4):459–470.

Bullock AK, Tilley DG, Johnston DN, Bowen CR, and Keogh PS. September 2009. **Non-linear friction in reciprocating hydraulic rod seals: simulation and measurement**. *7th International Conference on Modern Practice in Stress and Vibration Analysis*. Cambridge, UK.

Branson DT, Wang FC, Johnston DN, Tilley DG, Bowen CR, Keogh PS. August 2009. **Experimental testing and control development of a high bandwidth-high flow valve utilizing piezoelectric actuation of a Hörbiger plate**. *Joint meeting of the 12th International Meeting on Ferroelectricity and 18th IEEE International Symposium on the Application of Ferroelectrics*. Xi'an, China.

Course Programme 2009/10

The Centre for Power Transmission and Motion Control runs short courses for Continued Professional Development (CPD), covering fluid power systems and electrical drives. The course material is presented by staff and research workers with considerable industrial experience. The courses are presented at Bath and include a wide range of experimental demonstrations in the well-equipped laboratories. All courses cost **£995**, which includes comprehensive lecture notes, lunches and refreshments, and a certificate of attendance.

FP1	Introduction to Hydraulic Circuits and Components	23 - 26 February 2010
FP2	Component Selection for Hydraulic Systems	16 - 19 March 2010
FP3	Hydraulic System Design and Analysis	20 - 23 April 2010
ED	Electrical Drives for Mechanical Engineers	10 - 13 November 2009
MS	Control of Mechatronic Systems (replaces FP4)	01 - 04 December 2009

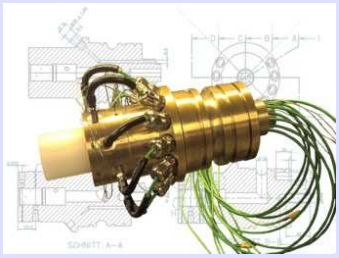
Courses can also be tailored to a particular customer's needs and may be presented at the customer's premises if required, in the UK or overseas. We would be pleased to discuss your needs.

Upcoming Conferences

DFP09 - 2nd Workshop on Digital Fluid Power	12 - 13 Nov 2009	Linz, Austria
7th International Fluid Power Conference	22 - 24 Mar 2010	Aachen, Germany
R3ASC'10 - 4th International Conference on Recent Advances in Aerospace Actuation Systems and Components	05 - 07 May 2010	Toulouse, France
6th FPNI PhD symposium at Purdue University	15 - 18 Jun 2010	West Lafayette, USA
Mechatronics 2010 - 12th Mechatronic Forum Biennial International Conference	28 - 30 Jun 2010	Zurich, Switzerland
AVEC 10 - 10th International Symposium on Advanced Vehicle Control	22 - 26 Aug 2010	Loughborough, UK
Control 2010 - UKACC International Conference on Control	07 - 10 Sep 2010	Coventry, UK

Bath/ASME Symposium on Fluid Power & Motion Control (FPMC 2010)

15-17 September 2010



FPMC 2010 will be the next in a series of annual International Symposia held at the University of Bath since 1988. It will be the third Bath Symposium to be jointly sponsored by the American Society of Mechanical Engineers.

The Symposia are well known and respected by the international research community and are attended by delegates from industry and academia.

http://www.bath.ac.uk/ptmc/symposium/

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About Us

The Centre for PTMC is internationally recognised for its industry-focused activities associated with power transmission and motion control. Founded in 1968, it currently has 8 full-time academic staff and around 20 research staff and PhD students. We are one of the leading academic providers of professional, technology-based consultancy and support services in Europe. Our objectives within the field of machine systems are to stimulate high quality industrially-relevant research and teaching, and to ensure research activities and technical expertise are accessible to industry through research partnerships and consultancy. More information about current projects, consultancy services, and training opportunities for postgraduate students and industrial delegates can be found on our website:

http://www.bath.ac.uk/ptmc/