



Citation for published version:

Johnston, DN & Plummer, A (eds) 2008, *Fluid Power and Motion Control (FPMC 2008)*. Centre for Power Transmission and Motion Control, Bath, UK.

Publication date:
2008

[Link to publication](#)

University of Bath

Alternative formats

If you require this document in an alternative format, please contact:
openaccess@bath.ac.uk

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Contents

Preface

Session 1 Condition monitoring, sensors and automation

A novel system layout for extended functionality of mobile machines 13
T Stamm von Baumgarten, B Grösbrink, T Lang, H-H Harms

Utilization of RFID and pressure sensor for intelligent hose condition monitoring 27
A Aarnio, L Elo, E Mäkinen, L Ukkonen, M Soini, L Sydänheimo, M Vilenius, M Kivikovski

Condition monitoring and fault diagnosis for vane pumps using flow ripple measurement 43
M Yang, K Edge, N Johnston

Session 2 System modelling

Recursive generalised neural networks (RGNN) for the modeling of a load sensing pump 59
T Wiens, R Burton, G Schoenau, D Bitner

An open-source Modelica library of fluid power models 77
C Paredis

Modelling pipeline dynamics using optimized finite element model 93
K Sanada

Modelling of hydraulics and mechanics of a mobile machine 109
A Vuohijoki, M Hyvönen, K Huhtala, M Vilenius

Session 3 Control I

Synchronous motion control of thrust system of pipe jacking shield machine 125
H Shi, G Gong, H Yang

Improvement in feedback signal quality for water hydraulic manipulator 137
A Muhammad, J Mattila, T Virvalo, M Vilenius

Robust control performance comparisons for a water hydraulic servo motor system 153
K Ito, S Ikeo, H Takahashi, N Kanamori

Session 4 High performance valves I

Magnetorheological (MR) damper with a fast response time 169
J Kostamo, E Kostamo, J Kajaste, M Pietola

Simulation of Piezoelectric high-speed digital valves 185
X Ouyang, H Yang, H Jiang, N Johnston

A reduced-order model for a poppet-type relief valve 201
N Manring

Session 5 Pneumatics

- Applicability of servopneumatic positioning systems for high loads 219
Y Ernesto A Mendoza, L Gonçalves de Oliveira, V Juliano De Negri
- Experimental assessment of a free elastic-piston engine compressor with separated combustion chamber 235
J Riofrío, E Barth
- Modelling and control of a free liquid-piston engine compressor 249
C Yong, E Barth, J Riofrío

Session 6 Efficient and intelligent systems

- The Center for Compact and Efficient Fluid Power 265
K Stelson
- Towards intelligent mobile machines - GIM research 277
K Huhtala, J Suomela, M Vilenius, A Halme
- Efficiency study of an excavator hydraulic system based on displacement-controlled actuators 293
C Williamson, J Zimmerman, M Ivantysynova
- New electro-hydraulic control systems for mobile machinery 311
R Finzel, S Helduser

Session 7 Pumps and noise

- Active systems for noise reduction and efficiency improvement of axial piston pumps 327
T Nafz, H Murrenhoff, R Rudik
- Design and optimisation of a novel hydraulic free piston engine with liquid-propellant-power 343
H Ren, H Xie, H Yang
- Adaptive attenuation of narrow band fluid-borne noise in a simple hydraulic system 357
L Wang, N Johnston

Session 8 Control II

- The design of fuzzy parameter self-tuning PID temperature controllers for large-scale hydraulic power units 373
C Chen, G Gong, H Yang, B Feng
- Higher-order sliding modes for an electropneumatic system: differentiation and output-feedback control 385
L Sidhom, M Smaoui, M Di Loreto, X Brun, E Bideaux, D Thomasset
- Comparison of digital hydraulic and traditional servo system in demanding water hydraulic tracking control 397
M Linjama, J Seppälä, J Mattila, M Vilenius

Session 9 Systems, modelling and design

- Study on the opening characteristics of super-high voltage circuit breakers with hydraulic operating mechanism 411
W Liu, B Xu, H Yang, Z Wu
- Compositional modelling of fluid power systems using predictive tradeoff models 425
R Malak, L Tucker, C Paredis
- A novel high efficiency electro-hydrostatic flight simulator motion system 441
K Cleasby, A Plummer

Session 10 High performance valves II

- Oil stiction in hydraulic valves - an experimental investigation 457
M Resch, R Scheidl
- Influencing parameters on tightness of hydraulic seat valves 471
M Schmidt, H Murrenhoff, H Lohrberg, F-J Korber
- Application of proportional seat valves to a self-energising electro-hydraulic brake 483
J Ewald, M Liermann, C Stammen, H Murrenhoff
- Experimental evaluation of a metering poppet valve 499
R Fales, C Li

Session 11 Control III

- Force control of a roller-screw electro-mechanical actuator for dynamic loading of aerospace actuators 515
K Wissam, J-C Mare
- Controlling a conventional LS-pump based on electrically measured LS-pressure 531
T Andersen, H Pedersen, M Hansen
- Equalization techniques for dual redundant electrohydraulic servoactuators for flight control systems 547
G Jacazio, L Gastaldi