John Lumkes

Ph.D. University of Wisconsin, Madison - 1997

Associate Professor

Agricultural and Biological Engineering
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ABE Engineering Teacher of the Year, 2007-2008, 2009-2010
Purdue Teaching Academy, 2009
Purdue Teaching for Tomorrow Award, 2006-2007
SAE Ralph R. Teetor Educational Award, 2002-2003

Research Areas:

Controls, Electrohydraulics & Design of Mobility Systems. Development of controller algorithms, electronics, and actuator systems for machines, camless engines, and hybrid vehicles. Autonomous and drive-by-wire technologies for vehicles. Modeling and simulation.

Classes Taught:

ABE 205 – Computations for Engineering Systems
ABE 460 – Sensors and Process Control
ABE 495Z – All Terrain Vehicle Design
SA 316R - China Globalization, Energy, Environment

Selected Publications (last 5 years):

Branson, D., Lumkes, J., Wattananithiporn, K., and Fronczak, F. (2008). Simulated and experimental results for a hydraulic actuator controlled by two high-speed on\off solenoid valves. International Journal of Fluid Power, 9(2) pp. 47-56.

Lumkes, J. and van Doorn IV, W. (2008). Design and testing of a dual path front hydrostatic drive-by-wire off road vehicle. Transactions of the ASABE, 51(4): 1165-1175.

Harmeyer, K., Holland, M., Gallien, T., Lumkes, J., and Krutz, G. (2009). Embedded sensors in Rubber and other polymer components. Strain (International Journal for Experimental Mechanics), doi: 10.1111/j.1475-1305.2007.00336.x.

McKinley, C. and Lumkes, J. (2009). Quantitative evaluation of an on-highway trucking fleet to compare #2ULSD and B20 Fuels and their impact on overall fleet. Applied Engineering in Agriculture, Vol. 25(3): 335-346.

Batdorff, M., and Lumkes, J. (2009). High fidelity magnetic equivalent circuit in an axisymmetric electromagnetic actuator. IEEE Transactions on Magnetics, 45(8):3064-3072.

Mahrenholz, J. and Lumkes, J., (2009). Coupled Dynamic Model for a High Speed Pressure Balanced 3-way On/Off Hydraulic Valve. J. Dyn. Sys., Meas., Control, 132, 10p.

Lumkes, J., Batdorff, M., and Mahrenholz, J. (2009). Characterization of losses in virtually variable displacement pumps. International Journal of Fluid Power, 10(3) pp. 17-27.

Selected Conference Presentations (last 5 years):

Andruch, J. and Lumkes, J. (2009). Regenerative hydraulic topographies using high speed valves. Accepted for publication and presentation at the SAE Commercial Vehicle Engineering Congress & Exhibition, October 2009, SAE Paper 2009-01-2846.

Holland, M., Harmeyer, K. and Lumkes, J. (2009). Design and implementation of an electronically controlled small engine hydraulic dynamometer. Accepted for publication and presentation at the SAE Commercial Vehicle Engineering Congress & Exhibition, October 2009, SAE Paper 2009-01-2847.

Andruch, J. and Lumkes, J. (2008). A hydraulic system topography with integrated energy recovery and reconfigurable flow paths using high speed valves. Proceedings of the 51st National Conference on Fluid Power (NCFP I08-24.1), p 649-657.

McKinley, C. and Lumkes, J. (2008). Using computational fluid dynamics (cfd) to simulate a cylinder head flow test. Proceedings of the 51st National Conference on Fluid Power (NCFP I08-8.3), p 247-252

Jose M Garcia, Gary W Krutz, John Lumkes Jr., Self Propelled Water Hydraulic Vehicle, 10th Scandinavian International Conference on Fluid Power, Conference Proceedings, Volume 1,session B1.

Batdorff, M., and Lumkes, J., Virtually Variable Displacement Hydraulic Pump Including Compressibility And Switching Losses, 2006 ASME International Mechanical Engineering Congress & Exposition, November 5-10, 2006, Chicago, IL USA.

van Doorn, W. and Lumkes, J., Directional Stability Enhancement Of A Dual Path Front Hydrostatic Drive By Wire Off-Road Vehicle, 2006 ASME International Mechanical Engineering Congress & Exposition, November 5-10, 2006, Chicago, IL

Lumkes, J., "The Integration of Student Design Competitions and Academic Curricula," 2006 ASME International Mechanical Engineering Control & Exposition, Nov. 5-10, 2006.

Holland, M., Harmeyer, K., and Lumkes, J., Electrically Controlled Fixed-Displacement Pump, Variable-Displacement Motor Hydrostatic Transmission, 2006 SAE Commercial Vehicle Engineering Congress & Exhibition, October 31- November 2, 2006, Chicago, IL USA.

Lumkes, J., van Doorn, W., and Donaldson, J., The Design and Simulation of a High Force Low Power Actuation System for Camless Engines, Proceedings of 2005 ASME International Mechanical Engineering Congress and Exposition, November 5-11, 2005, Orlando, FL USA

Hanks, T., and Lumkes, J. Adaptive Control System for Electrohydraulic Camless Engine Gas Valve Actuator, Proceedings of the 24th American Control Conference (ACC), June 8 to 10, 2005, Portland, Oregon.

Hadj-Kacem, N., and Lumkes, J., Fuel Consumption Simulation on the Federal Urban Drive Cycle of a Hydrostatic Transmission Vehicle Modeled with Bond Graphs, Proceedings of the 50th National Conference on Fluid Power (NCFP), March, 2005.