



John Lumkes

Ph.D. University of Wisconsin, Madison - 1997

Associate Professor, Agricultural & Biological Engineering

Associate Director, College of Engineering Global Engineering Program

Purdue Global Engineering Impact Award – 2012

The Charles B. Murphy Outstanding Undergraduate Teaching Award – 2011

Community of Service Learning Faculty Fellows – 2011

Purdue College of Agriculture David C. Pfendler Outstanding Counselor Award - 2010

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):

- Harmeyer, K., Holland, M., Gallini, 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.
- 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.
- Mahrenholz, J. and Lumkes, J., (2010). Coupled Dynamic Model for a High Speed Pressure Balanced 3-way On/Off Hydraulic Valve. *J. Dyn. Sys., Meas., Control*, 132, 10p.
- Long, G. and Lumkes, J. (2010). Comparison of using 2/2 and 3/2 high speed on/off valves and different control strategies for cylinder position control. *International Journal of Fluid Power*, (2010) No. 1 pp 21-32.
- Lumkes, J. (2010). Survey of Three Different Methods of Delivering Engineering Content in Lectures. *J. Educational Technology Systems*, 38(3):349-366.
- Merrill, K., Holland, M., Batdorff, M., and Lumkes, J. 2010. Comparative Study of Digital Hydraulics and Digital Electronics. *International Journal of Fluid Power*, 11(3) pp. 45-51.
- Garcia, J., Lumkes, J., Heckaman, B., and Martini, A. 2011. Viscosity Dependence of Static Friction in Lubricated Metallic Line Contacts, *Tribology Transactions*, 54: 3, 333 — 340
- Liu, Y., Tang, D., and Lumkes, J. 2012. Efficiency of pumping gasoline in service station. *IOP Conf. Ser.: Earth Environ. Sci.* 15 072007.
- Lumkes, J., Hallett, S., and Vallade, L. 2012. Hearing versus experiencing: The impact of a short-term study abroad experience in China on students perceptions regarding globalization and cultural awareness. *International Journal of Intercultural Relations*, 36(1), 151-159. <http://dx.doi.org/10.1016/j.ijintrel.2011.12.004>
- Yajun, L., Dian, T., Jun, L., and Lumkes, J., 2012. Wear behaviour of piston seals in flow meter of fuel dispenser under different pressure conditions, *Flow Measurement and Instrumentation*, Volume 28, December 2012, Pages 45-49, ISSN 0955-5986, 10.1016/j.flowmeasinst.2012.07.005.
- Seay, J. and Lumkes, J. 2014. Multi-University Partnership for Global Service Learning in Sub-Saharan Africa. *International*

Journal for Service Learning in Engineering, pp. 367–380, Fall 2014, ISSN 1555-9033.

- Xiong, S. and Lumkes, J. 2014. Coupled Physics Modelling for Bi-Directional Check Valve System, *International Journal of Fluid Power*, 15:2, 55-67, DOI:10.1080/14399776.2014.897500.

Selected Conference Presentations (last 5 years):

- Lumkes, J. 2012. Design of a Sustainable, Locally Manufacturable, Agricultural Utility Vehicle for Developing Countries. *International Conference Of Agricultural Engineering, Cigr-Ageng 2012, Valencia 8-12 July 2012, Book Proceeding ISBN 978-84-615-9928-8.*
- Liu, Y., Wang, W., Wang, Z., Wei, W., and Lumkes, J. (2013) *Frequency Conversion Controlled Vapor Recovery System by Temperature and Flow Signals: Model Design and Parameters Optimization*, SAE Technical Paper 2013-01-2348, 2013, doi:10.4271/2013-01-2348.
- Liu, Y., Wang, Z., Huang, Z., and Lumkes, J. 2013. New Designs in Fuel Dispensing System to Reduce Water Hammer. ASME/Bath Symposium on Fluid Power and Motion Control, Sarasota, FL., FPMC2013-4415.
- Merrill, K., Breidi, F., and Lumkes, J. 2013. Simulation Based Design and Optimization of Digital Pump/Motors, ASME/Bath Symposium on Fluid Power and Motion Control, Sarasota, FL., FPMC2013-4475.
- Skelton, D., Xiong, S., Breidi, F. and Lumkes, J. (2013) *High Performance Actuation Systems Enabled by Energy Coupling Mechanisms*. SAE Commercial Vehicle Engineering Congress & Exhibition, October 2013, SAE Paper 2013-01-2344.
- Skelton, D., Xiong, S., and Lumkes, J. (2014). Design of High Performance Actuation System for High Speed Valves. *Proceedings of the 9th International Fluid Power Conference (9.IFK)*, Aachen, Germany, March 24-26.
- Garcia, J., Kuleshov, Y., and Lumkes, J. (2014). Using fluid power workshops to increase STEM interest in K-12 students. *Proceedings of the 2014 American Society for Engineering Education Annual Conference and Exposition*. June 15-18.
- Breidi, F., Helmus, T., Holland, M., and Lumkes, J. 2014. The Impact of Peak-And-Hold and Reverse Current Driving Strategies on the Dynamic Performance of Commercial Cartridge Valves. *Proceedings of the ASME/Bath Symposium on Fluid Power and Motion Control*, University of Bath, England, FPMC2014-7846.
- Breidi, F., Helmus, T., and Lumkes, J. 2014. Development of a Portable Pneumatic Educational Tool for STEM Education. *Proceedings of the 53rd National Conference on Fluid Power, Las Vegas*, 8p.
- Dare, A.; Forin, T.; Ileleji, K.; Jesiek, B.K.; Lumkes, J.; Pawletko, P., 2014. "Community capacity building: Collaborative micro-hydropower design in Cameroon," *Global Humanitarian Technology Conference (GHTC)*, 2014 IEEE , vol., no., pp.479,485, 10-13 Oct. 2014, doi: 10.1109/GHTC.2014.6970326