Dr. Timothy O. Deppen
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EDUCATION:

- University of Illinois at Urbana-Champaign, College of Engineering
  - Graduated PhD, Mechanical Engineering, *May 2013*
    - Dissertation: Optimal Energy Use In Mobile Applications With Storage
  - Graduate GPA at University of Illinois at Urbana-Champaign: **3.95**
  - Graduated BS, with Highest Honors, and MS in Mechanical Engineering, *August 2009*
- High School Diploma, Fort Zumwalt West High School, O'Fallon, Missouri, *2003*
  - Valedictorian of High School class of 427 students

LEADERSHIP POSITIONS:

- Co-founder of Servarbo
  - 2013 Cozad New Venture Competition, "Most Fundable Venture" Award
  - 2014 Champaign County Innovation Celebration: Entrepreneurial Excellence for Student Startup
- Center for Compact and Efficient Fluid Power Student Leadership Council:
  Treasurer, *2008 – 2009*; President, *2009 – 2010*; Executive Committee Rep, *2010 – 2011*; President, *2011 – 2012*
  - Created a student orientation program, organized a $10,000 student travel grant program and a $2,000 project grant program, served as a liaison between Center students and the Center executive committee.
- Vice President, Graduate MechSE Students, *2012*
- Graduate Student Advisory Committee for College of Engineering at UIUC, *2009 - 2010*
- President, Society of Manufacturing Engineering, UIUC Chapter, *2005 – 2007*
- Secretary, Pi Tau Sigma, *Fall 2006*
- Co-founder of Engineering & Robotics, RSO, *2004*

EMPLOYMENT:

- President of Servabo Inc., *Summer 2013 – Present*
- *Postdoc Research Associate with Alleyne Research Group Fall 2014 – Present*
- Contingent Employee with Deere & Co., *Fall 2013 – Summer 2014*
  - Supported a variety of vehicle system modeling projects including: soil interaction, electric powersystems, longitudinal vehicle dynamics, architecture optimization, and terrain mapping. These projects spanned a wide variety of software tools including Matlab, Matlab GUI design, Simulink, AMEsim, and Isight.
- Graduate Hourly Appointment with John Deere Technology Innovation Center, Champaign Il, *Summer 2013*
  - Developed dynamic models of tractors from first principles analysis and statistical analysis of experimental data. Tractor models were integrated into an overall system analysis and design optimization tool.
- Office of Naval Research Naval Research Enterprise Internship Program, *Summer 2012*
  - I worked with a team of two other students to design an energy scavenging hydrogen

storage ship. This ship was designed to use alternative energy sources such as solar, wind, and wave to capture energy and then store said energy in the form of hydrogen fuel. My duties included modeling the ship's power grid and designing a control strategy to regulate the generation, storage, and distribution of electrical power.

- Teaching Assistant, University of Illinois, Champaign-Urbana, ME 460: Industrial Control Systems, *Fall 2011*
  - o I served as a teaching assistant for ME 460: Industrial Control Systems. This is an introductory control course for both graduate and undergraduate students at UIUC. As the teaching assistant I was responsible for organizing, running, and grading all of the labs. The laboratory focuses on applying basic feedback control to a computer controlled hydraulic trainer stand. This gives students an opportunity to apply fundamental concepts like time-domain analysis, frequency-domain analysis, and proportional-integral-derivative control. In addition to teaching the standard lab material, I utilized my advanced knowledge of hydraulic machinery to develop supplementary material for the course. This included handouts describing the operation of electrohydraulic servovalves and first-principles modeling of hydraulic circuits.

- Graduate Research Assistant, University of Illinois, Champaign-Urbana, Alleyne Research Group, *Spring 2008 to Spring 2013*
  - o As a research assistant in the Alleyne research group I have worked on how to optimize the generation, distribution, and storage of energy within mobile systems. This work includes modeling of mechanical, hydraulic, electrical, and thermal systems as well as the development of optimal controller. My control research has focused on applying model predictive control (MPC) to these systems. MPC is a receding horizon optimal control framework which we use to achieve an operator's performance demand while maximizing the system's efficiency. In addition, I have developed a test stand for experimental studies of hydraulic hybrid vehicles at UIUC. This research is supported by the Center for Compact and Efficient Fluid Power, a NSF sponsored engineering research center (ERC). As a member of the CCEFP I have been very active in the student leadership council and support the Center administration. I have served as the student representative to the executive committee, worked with others to create a travel grant program to promote student initiated collaboration, and represented the Center at the annual ERC meeting.

- Student Researcher in the Center for Compact and Efficient Fluid Power, *2008- 2013*
- Student Cooperative Employment Program, Boeing, St. Louis, Mo, *2004 – 2007*
  - o Worked as a student co-op with Boeing for four different terms in four different divisions: Flight Testing And Evaluation Team (2004), Aeroelasticity Test Group (2005) Advanced Digital Design and Manufacturing Team (2006), and Structural Definition (2007).

VOLUNTEERING:

- Take back the night rally and march against sexual violence, *2014*
- Champaign County Humane Society, *2010-2012*

PUBLICATIONS AND PRESENTATIONS:

- Deppen, T., A. Alleyne, K. Stelson, J. Meyer, "Optimal Energy Use In a Light Weight Hydraulic Hybrid Passenger Vehicle", *Journal of Dynamic Systems, Measurements and Control*, Vol. 134(4), 2012.
- Deppen, T., A. Alleyne, K. Stelson, J. Meyer, "An Energy Management Strategy for a Hydraulic Hybrid Vehicle", Proceedings of the American Control Conference, ACC 2012.
- Deppen, T., A. Alleyne, K. Stelson, J. Meyer, "Sensitivity Analysis of Energy Management Strategies For Hydraulic Hybrid Vehicles", Proceedings of the ASME Dynamic Systems and Control Conference, DSCC 2012.
- Deppen, T., A. Alleyne, K. Stelson, J. Meyer, "A Model Predictive Control Approach for a Parallel Hydraulic Hybrid Powertrain", Proceedings of the American Control Conference, ACC 2011.
- Deppen, T., A. Alleyne, K. Stelson, J. Meyer, "Model Predictive Control of An Electro-

Hydraulic Powertrain with Energy Storage", Proc. of the ASME Dynamic Systems and Control Conference, DSCC 2011.

- Deppen, T., A. Alleyne, K. Stelson, J. Meyer, "Predictive Energy Management for Parallel Hydraulic Hybrid Passenger Vehicle", Proceedings of the ASME Dynamic Systems and Control Conference, DSCC 2010.
- Deppen, T., A. Alleyne, K. Stelson, J. Meyer, "Model Predictive Energy Management of a Hybrid Hydraulic Vehicle", Proceedings of the 6th FPNI PhD Symposium 2010

HONORS:

- List of Teachers Ranked Excellent, *Fall 2011*
- Mechanical Science and Engineering Outstanding Scholar Fellowship, *2008 - 2011*
- Bronze Tablet, University of Illinois, Champaign-Urbana, *2010*
- A.T. Peebles Award, Department of Mechanical Science and Engineering, *2008*
- MechSE Dept. O.A. Leutwiler Award For Outstanding Senior, *2007*
- AACE, International Scholarship Competition, 2nd Place Winner, *2007*
- Top 100 Seniors of the Class of 2007, University of Illinois, Champaign-Urbana, *2007*
- James Scholar, University of Illinois, Champaign-Urbana, *2003-2007*

PROFESSIONAL SOCIETIES:

- Licensed Professional Engineer Intern, State of Illinois, *2008- Present*
- Order of the Engineer, *2007*
- American Society of Mechanical Engineers, *2003 – Present*

SKILLS:

- Matlab
- Simulink
- Coding in Matlab M-file language
- Solid Works
- Isight
- AMEsim