

## **Biographical Sketch of ANDREA VACCA**

Professor, Maha Fluid Power Research Center

School of Mechanical Engineering (ME) / Agricultural and Biological Engineering Dept. (ABE)

Purdue University – West Lafayette, Indiana 47907-1288

phone: 765 430 0081; email: avacca@purdue.edu; web: <https://engineering.purdue.edu/Maha/>

### **1. Education**

Univ. of Parma, Italy	Mech. Engineering (5 yrs. degree)	M.S. (with honors)	1999
Univ. of Florence, Italy	Mech. Engineering - Energy Systems	Ph.D.	2005

### **2. Appointments**

8/2018 – present	Professor, ABE/ME, Purdue University
8/2014 – 8/2018	Associate Professor, ABE/ME, Purdue University
3/2010 – 8/2014	Assistant Professor, ABE/ME, Purdue University
9/2005 – 3/2010	Assistant Professor, Industrial Engineering Dept., Univ. of Parma, Italy

### **3. Professional & Synergistic Activities**

#### ***Memberships and participation in academic, professional and scholarly societies***

2018-present: co-chair of the ASME (American Society of Mechanical Engineers), FPST Division (Fluid Power System and Technology)

2016-present: Director of GFPS (Global Fluid Power Society, [www.gfpsweb.org](http://www.gfpsweb.org))

2011-2014: SAE (Society Automotive Engineers) – Fluid Power & Hydraulic division chair

2010-present: Member of ASME (American Society of Mechanical Engineers)

2008-present: Member of SAE (Society of Automotive Engineers)

#### ***Participation in journal boards and conference organization***

2018-present: Editor in Chief for the International Journal of Fluid Power

2018-present: Editorial Board member: Int. Journal of Hydromechatronics, Inderscience

2017: General Chair for the FPMC 2017 ASME/Bath Symposium on Fluid Power & Motion Control, October 2017, Sarasota FL

2016-present: Guest Editor for the Special Issue "Energy Efficiency and Controllability of Fluid Power Systems" of Energies (MDPI)

2015-present: Editorial board member for the Journal of Dynamics and Vibroacoustics

2011-present: Member of the Scientific or Program Committee, Session Organizer for more than 25 international fluid power conferences

2011-2018: Associate Editor the for International Journal of Fluid Power

#### ***Other Synergistic Activities***

2019-present: roadmap committee member for the National Fluid Power Association (NFPA)

2017-present: member of the US Tech. Advisory Group to ISO/TC 131 – Fluid power systems

2014-present: Member of the International Advisory Council of Samara State Aerospace University, Russian Federation (<http://5top100.com/universities/samara-aerospace/>)

2011-present: Member of the doctoral program evaluation committee, Univ. of Parma, Italy.

### **4. Honors and awards**

2020: Best Editorial Board Member, Chinese Society of Theoretical and Applied Mechanics

2018: Best Paper Award, 2018 ASME/Bath Symposium on Fluid Power and Motion Control, Sep 12-14, 2018, University of Bath, UK

2017: Best Paper Award, 2017 ASME/Bath Symposium on Fluid Power and Motion Control, Oct. 16-19, 2017, Sarasota, FL, USA  
 2017: Purdue Bravo Award “Moving the University Forward”  
 2017: Best Paper Award, 15th Scandinavian International Conference on Fluid Power (SICFP2017), June 7-9, 2017, Linköping, Sweden  
 2016: Best paper award, 3rd Int. Conference on Dynamics and Vibroacoustics of Machines, June 29-July 1, 2016, Samara, Russia  
 2015: Donald Julius Groen Prize of the Inst. of Mechanical Engineers (IMechE)  
 2015: Outstanding Teaching Award – Agricultural and Biological Engineering Dept.  
 2010: SAE Excellence in Oral Presentation Award, SAE Commercial Vehicle Engineering Congress 2010, October 5-6, 2010, Rosemont, IL, USA

### **5. Relevant Teaching Experience**

2019-present: Purdue ME597/ABE491 Design and Modeling of Fluid Power Systems  
 2012-present: Purdue ABE435 Hydraulic Control Systems  
 2011-present: Purdue ME 309 Fluid Mechanics  
 2011-present: Purdue ME467: Hydraulic Vehicle Design  
 2005-2010: *Fluid Power Systems* (in Italian) Mech. Eng., undergraduate level  
 2005-2010: *Testing Methods in Fluid Machinery* (in Italian) Mech. Eng., graduate level

### **6. Impact of work:**

- Current team: 25 researchers (1 Post Doc, students: 19 PhD, 2 MS, 1 BS, 2 Visiting Scholars)
- MS students graduated with Dr. Vacca: 29 (6 Best Italian Thesis in Fluid Power awards)
- PhD students graduated with Dr. Vacca: 14; Post-Doc supervised: 2
- 73 journal papers, 103 conference papers (71 refereed), 6 prize papers
- 2 textbooks
- About 9.5 M USD in research funding since 2010
- More than 50 industry projects since 2010
- Developer of the HYGESim simulation tool for gear pumps and motors, used at Purdue and at industry sponsors.

### **7. Five most relevant journal publications**

- Cristofori, D. and Vacca, A., 2012, *The Modeling of Electro-Hydraulic Proportional Valves*, ASME J. of Dynamic Systems, Measurement and Control, Vol.134(2), 021008 (13 pages).
- Ritelli, G.F., Vacca, A., 2013, *Energetic and Dynamic Impact of Counterbalance Valves in Fluid Power Machines*, Energy Conversion and Management, 76 (2013) pp. 701-711.
- Zhou, J., Vacca, A., Casoli P., 2014, *A Novel Approach for Predicting the Operation of External Gear Pumps Under Cavitating Conditions*, Simulation Modelling Practice and Theory, vol. 45, pp 35-49.
- Devendran, R. and Vacca, A., 2017, *Theoretical Analysis for Variable Delivery Flow External Gear Machines Based on Asymmetric Gears*, Mechanism and Machine Theory 108 (2017) 123–141.
- Thiagarajan, D., Vacca, A., Watkins, S., 2019, *On the Lubrication Performance of External Gear Pumps for Aerospace Fuel Delivery Applications*, Mechanical Systems and Signal Processing, 129, pp 659-676.