Medhat Khalil, Ph.D., CFPAI, CFPHS.

Director of Professional Education & Research Development,
Applied Technology Center, Milwaukee School of Engineering, Milwaukee, WI, USA.

Objective: Apply my academic background and industrial experience towards academic teaching, research, professional education and industry development.

Industries Experienced in: Fluid Power, System Dynamics & Control and Modeling & Simulation of Physical Systems.

Biography:

Medhat Khalil, Ph.D. Director of Professional Education & Research Development at the Applied Technology Center, Milwaukee School of Engineering, Milwaukee, WI, USA. Medhat has consistently been working on his academic development through the years, starting from Bachelor and Master Degree in Mechanical Engineering in Cairo Egypt and proceeding with his Ph.D. in Mechanical Engineering and Post-Doctoral Industrial Research Fellowship at Concordia University in Montreal, Quebec, Canada. He has been certified and is a member of many institutions such as: Certified Fluid Power Hydraulic Specialist (CFPHS) by the International Fluid Power Society (IFPS); Certified Fluid Power Accredited Instructor (CFPAI) by the International Fluid Power Society (IFPS); Member of Center for Compact and Efficient Fluid Power Engineering Research Center (CCEFP); Listed Fluid Power Consultant by the National Fluid Power Association (NFPA); Member of the Board at the International Fluid Power Society (IFPS); and Member of American Society of Mechanical Engineers (ASME). Medhat has balanced academic and industrial experience. Medhat has a vast working experience in the field of Mechanical Engineering and more specifically hydraulics, having developed and taught fluid power system training courses for industry professionals, being quite aware of the technological developments in the field of fluid power and motion control and the production program of the leading fluid power leading companies. In addition, Medhat had worked for several world-wide recognized industrial organizations as Rexroth in Germany and CAE in Canada. Medhat had designed several hydraulic systems and developed several analytical and educational software. Medhat also has vast experience in modeling and simulation using Matlab-Simulink. Medhat has a pending patents and books about to be released.

Academic Education:

Mar 2003 – June 05	**Post Doctorate Industrial Research Fellowship.** Power Systems Control and Simulation Department, CAE Inc., Montreal, Quebec, Canada.
March 2003	**2nd Ph.D. (Doctor of Philosophy) in Mechanical Engineering.** College of Engineering, Concordia University, Montreal, Canada. **Thesis Title:** Performance Investigation of Swash Plate Axial Piston Pumps With Conical Cylinder Block.
July 2001	**1st Ph.D. (Doctor of Philosophy) in Mechanical Engineering.** College of Engineering, Cairo University, Cairo, Egypt. **Thesis Title:** Fuzzy Logic Control and Performance of Swash Plate Pumps.
March 1989	**Master of Mechanical Engineering.** College of Engineering, Cairo University, Cairo, Egypt. **Thesis Title:** Theoretical and Experimental Investigation of Performance of Four Nozzle Hydraulic Servo-Valve
June 1983	**Bachelor of Engineering.** Military Technical College, Cairo, Egypt. **Major:** Mechanical Engineering. **Minor:** Automotive Engineering.

Professional Membership & Certification:

- Certified Hydraulic Specialist by the International Fluid Power Society IFPS.
- Certified Accredited Fluid Power Instructor by the International Fluid Power Society IFPS.
- Member of Center for Compact and Efficient Fluid Power Eng. Research Center (CCEFP).
- Listed fluid power consultant by the National Fluid Power Association (NFPA).
- Member of the board at the International Fluid Power Society (IFPS).
- Member and Instructor, American Society of Mechanical Engineers (ASME).

Research Awards and Grants:

- 2013, $200k MAHA fund for building 4 basic trainers.
- 2012, Otto Maha Pioneer in Fluid Power Award on 2012.
- 2010, $336K MAHA Funds – Milwaukee School of Engineering, Duplicate the Universal Trainer prototype.
- 2009, $120K CCEFP-NSF, Design and Development of "Universal Fluid Power Trainer"
- 2003, Post-Doctoral Industrial Research Fellow (IRF), Natural Sciences and Engineering Research Council of Canada, NSERC.
- 2001, First prize of the student design paper competition, International Conference on Multidisciplinary Design in Engineering CSME-MDE2001, November 21-22, Concordia University, Montreal, Canada.

Machine Design and Consultancy Work:

- Contribution to modeling and simulation of a hydro-pneumatic compressor for energy storage project for General Compression.
- X-Pump modeling and simulation, Ocean Pacific Technology. http://www.ocean-pacific-tec.com/.
- Fluid Test Stand, Rohmax. http://www.rohmax.com/product/rohmax/en/Pages/default.aspx.
- Smart flow valve to protect hydraulic system from catastrophic line failure. http://www.smartflowtechnologies.com/.
- Universal Fluid Power Trainer, CCEFP project. http://www.ccefp.org/education-outreach/industry/transportable-laboratory.
- Several hydraulic power units for various industrial applications. List is available upon request.

Patent:

- Double Swash Plate Pump with Valve Ring Concept "Pending Patent."

Books:

- Introduction to Hydraulics for Industry Professionals "6 Chapters Completed"

Laboratories Development:

Contributed in specifying and commissioning of many research and training labs for different educational institutions as follows:

- Fluid Power Training Lab, Milwaukee School of Engineering, USA.
- Fluid Power Research Lab, Concordia University, Montreal, Canada.
- Hydraulic Training Center, Egyptian Iron & Steel Co., Cairo, Egypt.
- Fluid Power Research Lab, Faculty of Engineering, Cairo University, Cairo, Egypt.
- Hydraulic & Pneumatic Labs Developed Industries Institute, Cairo, Egypt.
- Fluid Power Training Lab, Civil Aviation Authorization, Imbaba Airport, Giza, Egypt.
- Fluid Power Training Lab, Port Training Institute, Alexandria, Egypt.

Voluntary Workshops and Webinars:

- Matlab-Simulink for Industrial Applications, Concordia University, Montreal, Canada
- Overview of Industrial Pneumatics, National Fluid Power Association, USA.
- Energy Saving Strategies for Hydraulic Systems, National Fluid Power Association, USA.
- Overview of Hydraulic Systems, Penton Publications, USA.
- Hydro-Mechanical vs. Electro-Mechanical Solutions, USA.
- Hydraulic Pump Modeling for Application Engineers. IFPS, USA

Software Copyright and Chapters in E-Books:

- "Med-Hyd", software for editing, design and simulation of hydraulic control systems. Reference number: 119/96. Registration date: 14 February 1996. Registration organization: Information and Decision Support Center (IDSC), Arab Republic of Egypt.
- Hydraulic Component Sizing Calculator, Congress Library, September 11, 2006 - Registration # TX-6-520-967.
- Introduction to Hydraulic Systems, Congress Library, February 2, 2007 - Registration number TX-6-509-982.

Publications:

Journals Refereed Papers:

1. M.K. Bahr Khalil and Don Lopper, "Hydraulic System Protection against Catastrophic Line Failure using Local Safety Valve", **International Journal of Fluid Power,** Vol. 9 #2, pp. 35-46, August 2008. **Germany**.
2. M.K. Bahr Khalil and Shajan John, "IESHYD010V01 - Hydraulic Components Sizing Calculator", **International Journal of Fluid Power**, Vol. 8 #3, pp. 65-67, November 2007. **Germany**.
3. M. K. Bahr Khalil, J. Svoboda and R.B. Bhat, "Modeling of Swash Plate Axial Piston Pumps with Conical Cylinder Blocks", **Journal of Mechanical Design**, ASME Transaction**,** Vol.126, pp 196-200, January 2004, **USA**.
4. M. K. Bahr Khalil, J. Svoboda and R.B. Bhat, "Dynamic Loads on the Drive Shaft Bearings of Swash Plate Axial Piston Pumps with Conical Cylinder Blocks", **CSME Transaction**, Vol.27 #4, pp 309-318, January 2004, **Canada.**
5. M. K. Bahr, J. Svoboda and R.B. Bhat, "Vibration Analysis of Constant Power Regulated Swash Plate Axial Piston Pumps" **Journal of Sound and Vibration**, Vol. 259(5), pp1225-1236, January 2003, **USA**.
6. M.K. Bahr Khalil, V. Yurkevich , J. Svoboda and R. B. Bhat "Implementation of Single Feedback Control Loop For Constant Power Regulated Swash Plate Axial Piston Pumps" **International Journal of Fluid Power**, Vol. 3 #3, pp27-36, December. 2002, **Germany**.
7. M. K. Bahr, "Geometrical Analysis of Four-Nozzle Pintle Hydraulic Servovalves", **Engineering Research Bulletin**, Vol. 2, pp102-115, 1991, Faculty of Engineering, Mataria, Cairo, **Egypt.**

Conference Proceedings:

8. M.K. Bahr Khalil, "ON THE MODELING OF HYDRAULIC PUMPS FOR APPLICATION ENGINEERS, ARTICLE #1" 53rd National Conference on Fluid Power, International Fluid Power Exhibition, IFPE 2011 Technical Conference, March 2014, **Las Vegas, NV., USA.**
9. M.K. Bahr Khalil, "Design Process of an Electro-Hydraulic Cylinder Position Feedback Control System" 52st National Conference on Fluid Power, International Fluid Power Exhibition, IFPE 2011 Technical Conference, March 2011, **Las Vegas, NV., USA.**
10. M.K. Bahr Khalil, "Interactive Analysis of Closed Loop Hydraulic Control System", Proceedings of the Thirteenth International Conference on Aerospace Science & Aviation Technology, ASAT13, May 26 – 28, 2009, **Cairo, Egypt.**
11. M.K. Bahr Khalil, "Estimated versus Calculated Viscous Friction Coefficient in Spool Valve Modeling" Proceedings of the 51st National Conference on Fluid Power, International Fluid Power Exhibition, IFPE 2008 Technical Conference, March 2008, **Las Vegas, NV., USA.**
12. M.K. Bahr Khalil, "Innovative Tool for Custom Course Building and Delivery", **11th Annual World Conference on Continuing Engineering Education,** May 2008, **Atlanta, USA.**
13. Khalil, M.K., Deping Li and Bhat, R.B. "Controlling of Rolling Mills Operating Conditions Using Variable Displacement Pump and Electro-Hydraulic Pressure Compensator". 12th International Conference on Applied Mechanics and Mechanical Engineering AMME-12, May 16-18, 2006, Military Technical College, Cairo, **Egypt**.
14. M. K. Bahr, J. Svoboda and R.B. Bhat, "Experimental Investigation on Swash Plate Axial Piston Pumps with Conical Cylinder Blocks Using Fuzzy Logic Control" International Mechanical Engineering Congress and Exposition ASME-ME2002, November 17-21, 2002, New Orleans, **USA**.
15. M. K. Bahr, J. Svoboda and R.B. Bhat, "Dynamic Loads on the Drive Shaft Bearings of Swash Plate Axial Piston Pumps with Conical Cylinder Blocks", CSME Forum2002, May 21-24, 2002, Queen's University, Kingston, **Canada.**
16. M. K. Bahr, J. Svoboda and R.B. Bhat, "Response of Constant Power Regulated Swash Plate Axial Piston Pumps to Harmonic and Random Inputs", International Conference on Multidisciplinary Design in Engineering, CSME-MDE2001, November 21-22, 2001, Concordia University, Montreal, **Canada**. Winner of the first prize of the student paper competition.
17. S.A. Kassem and M.K. Bahr, "Fuzzy Logic Control of Constant Power Regulated Swash Plate Axial Piston Pumps", International Mechanical Engineering Congress and Exposition ASME-ME2001, November 11-16, 2001, New York, **USA**.
18. S.A. Kassem and M. K. Bahr, "On the Dynamics of Swash Plate Axial Piston Pumps with Conical Cylinder Blocks", Sixth Triennial International Symposium on Fluid Control Measurement and Visualization Flucome2000, August 13-17, 2000, Sherbrooke University, Sherbrooke, **Canada**.
19. S.A. Kassem and M. K. Bahr, "Effect of Port Plate Silencing Grooves on Performance of Swash Plate Axial Piston Pumps", 7th Mechanical Design and Production Congress MDP7, Pergamon Press139-148, February 2000, Faculty of Engineering, Cairo University, Cairo, **Egypt**.