

Mahmoud S. Helal, Ph. D.

Assistant Professor

**Electrical Power & Machines department
Faculty of Engineering, Benha University**

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RESEARCH INTEREST

- Power System Dynamics: Stability & Control
- Robust Control
- Decentralized control of large scale systems
- Type II, Type III Fuzzy & Adaptive Fuzzy Control
- Convex & Nonconvex Optimization Techniques (LMI, PSO, GA, ACO, ABC, BAT, BFOA, etc ...)
- Wind Energy Conversion Systems (WECs)
- Static Output Feedback (SOF) Algorithms
- Interval Arithmetic applications in Control Systems

EDUCATION

2005-2009	Dept. of Electrical Power & Machines, Benha University Ph. D. in Electrical Power Networks Dissertation Title: ROBUST/RELIABLE STABILIZATION OF POWER SYSTEMS WITH UNCERTAIN DYNAMICS.	Cairo, Egypt
2002-2004	Dept. of Electrical Power & Machines, Benha University M. Sc. in Electrical Power Networks Dissertation Title: APPLICATION OF AI TECHNIQUES IN POWER SYSTEMS MODELING AND CONTROL	Cairo, Egypt
2000-2002	Dept. of Electrical Power & Machines, Benha University Postgraduate studies: 8 courses Grade: Excellent (86.7%)	Cairo, Egypt
1995-2000	Faculty of Engineering at Shoubra, Benha University B. Sc. in Electrical Power & Machines Final Year Grade: EXCELLENT (90.6 %) Five Year Grade: VERY GOOD (80.36%)	Cairo, Egypt

WORK EXPERIENCE

2010-till	Faculty of Engineering, Benha University Lecturer at Electrical Power & Machines Department. Teaching and developing power system control courses, developing lab manuals, supervising postgraduate and undergraduate students and participating in the exam works. Courses Taught: Electric Circuits I & II, Power system analysis I & II, Automatic Control Systems I & II, Signals & Systems, Electric Power Measurements & Testing, Computer Applications in Power Systems, Fuzzy Logic Control, Power System Dynamics, and Graduation Projects.	Cairo, Egypt
2009-2010	Engineering College, Qassim University Assistant Professor at Electrical Engineering Department. Teaching undergraduate courses, Academic Advisor for undergraduate students. Courses Taught: Fundamentals of Electric Circuits, Measurements & Instrumentation and Graduation Project.	Buraydah, KSA

- 2004-2009** **Faculty of Engineering, Benha University** **Cairo, Egypt**
Teaching and Research Assistant at Electrical Power & Machines Department. Assisting in teaching fundamentals of electrical engineering, power systems and Control system engineering courses, developing course sheets, preparing laboratory experiments and participating in the exam works.
Courses Taught: Fundamentals of electrical engineering, Electric Circuits I & II, Properties of electric materials, Electromagnetic fields, Generation & Distribution of Electrical Power, Power Systems Analysis I & II, Measurements & Instrumentation, Computer Applications in Power Systems, Automatic Control Systems I & II, Economics of Electrical Power Generation & Distribution.
- 2002-2004** **Faculty of Engineering, Benha University** **Cairo, Egypt**
Teaching and Research Assistant at Electrical Power & Machines Department. Assisting in teaching fundamentals of electrical engineering, power systems and Control system engineering courses, developing course sheets, preparing laboratory experiments and participating in the exam works.
Courses Taught: Fundamentals of electrical engineering, Electric Circuits I & II, Properties of electric materials, Electromagnetic fields, Generation & Distribution of Electrical Power, Power Systems Analysis I & II, Measurements & Instrumentation, Computer Applications in Power Systems, Automatic Control Systems I & II, Economics of Electrical Power Generation & Distribution.
- 2001-2002** **Ministry of Electricity & Energy** **Cairo, Egypt**
Execution Follow-up Engineer at the Authority of Village Electrification, Qalubia Governorate, Egypt.

AWARDS

- 2015** **Award of excellence in scientific research** for international publication from Benha University.
2014 **Award of excellence in scientific research** for international publication from Benha University.
2011 **Award of the Best Five Ph. Ds.** in the Engineering Sector, from Ministry of Higher Education, Throughout 2008-2010.
2000 **ARE's President Award** for being ranked within the first ten Engineers in my faculty, Dec. 2000
2000 **Graduation Award** for being ranked the second in my class over five years, Faculty of Engineering, Benha University.
1995-2000 **Annual Excellence Award** for being ranked the first in my class, Faculty of Engineering, Benha University.

PUBLICATIONS

Published Papers

- [1] Robust non-fragile power system stabilizer, Electrical Power and Energy Systems, Vol. 64, pp. 626-634, 2015. © Elsevier
- [2] Parameterization of robust three-term power system stabilizers, Electric Power System Research, Vol. 117, pp. 172-184, 2014. © Elsevier
- [3] Artificial Bee Colony Optimization of AGC in a Two-area Interconnected Power System, Middle East Power Conference (MEPCON), Ain Shams University, Cairo, Egypt, 2014.
- [4] Optimal Tuning of PID Controllers for Hydrothermal Load Frequency Control Using Ant Colony Optimization, Int. J. Elect. Eng & Informatics, Vol. 5, No. 3, pp. 348-60, 2013.
- [5] Ant Colony Optimization based PID for single area load frequency control, Proc. Int. Conf. Modeling, Identification & Control (ICMIC), Cairo, Egypt, 31 Aug -2 Sept, pp. 119-123, 2013.
- [6] Characterization of all robust PD-based PSSs: an interval arithmetic approach, Proc. of IEEE/PES General Meeting, Vancouver, BC, Canada, 21-25 July, pp. 1-5, 2013.
- [7] Robust dynamic stability assessment of fuzzy logic power system stabilizer," Proc. Int. Conf. Modeling, Identification & Control (ICMIC), Cairo, Egypt, 31 Aug -2 Sept, pp. 124-128, 2013.
- [8] An LMI Design of an Observer-based Fuzzy PSS, Proc. of 17th IFAC World Congress, Vol. 17, No. 1, pp.15903-15908, Seoul, Korea, July 6-11, 2008.

- [9] LMI Static Output Feedback Design of Fuzzy Power System Stabilizers, Expert System with Applications, vol. 36, no. 3P2, pp. 6817-6825, April 2009 © Elsevier
- [10] Design of a Fuzzy Multi-Objective Power System Stabilizer, European Journal of Control, Vol. 6, pp. 649-664, DOI: 10.3166/EJC. 15.649-664, 2009, © EUCA.
- [11] Design of a Robust Fuzzy Power System Stabilizers, Control & Intelligent Systems, Vol. 37. No. 4, pp. 227-234, 2009.
- [12] Robust Decentralized PID-Based Power System Stabilizer Design Using an ILMI Approach, Electric Power System Research, Vol. 80, No. 12, pp. 1488-1497, Dec. 2010. © Elsevier
- [13] Decentralized Design of a Fuzzy Multi-objective Power System Stabilizer via Linear Matrix Inequalities. In R. E. Vargas (ed.), Fuzzy Logic: Theory, Programming and Applications, pp. 269-320, Nova Science Publishers, Inc., Hauppauge, NY, 2009. © Nova publishers.

Submitted papers

- [1] Robust observer based power system stabilizer design: an LMI approach, submitted to Int. J. Elect. power Energy Syst. for possible publication.
- [2] Robust power system stabilizer design using interval arithmetic, submitted to int. J. Modeling, Ident., and Cont for possible pub.
- [3] Robust resilient design of PID-based collective blade pitch control for a wind power plant, submitted to J. Renewable Energy.
- [4] Robust decentralized multiobjective stabilization of multimachine power systems using LMI Optimization, to be submitted to Electric power components and systems
- [5] Synthesis of robust PSS using Gauss-Lucas Theorem, submitted to IET cont. theory and applications.
- [6] Design of PID-based Load frequency controllers using Hermite-Behieler Theorem, submitted to Asian Journal of control.
- [7] Generalizations of *D*-Decomposition method in the design of power system damping controllers, submitted to Electric power system research.
- [8] Synthesis of fractional order PID controllers for automatic generations control, submitted to European journal of control

PERSONAL INFORMATION

- Citizenship : Egyptian
- Marital Status : Married (+3)
- Date of Birth : December 15th, 1977
- Place of Birth : Cairo, Egypt
- Military Service : Completed

REFERENCES

- **Abdelateif Elshafei**, Professor
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- **Wagdy Mansour**, Professor
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- **Fahmy Bendary**, Professor
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