

ASSOCIATE PROFESSOR WALAA GABR

Name: **Dr. Walaa Ibrahim Gabr**

Position: **Associate Professor of Electrical Engineering**
Dept of Electrical Engineering,
Benha Faculty of Engineering,
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Date of Birth: June 24, 1976.

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Membership in Professional Societies:

1. Institution of Electrical and Electronic Engineers (IEEE USA).
2. Egyptian Engineering Syndicate.
3. Association of American Egyptian Scholars.
4. International Federation of University Women.

Education:

Degree	Course	University	Graduation Date
Ph.D.	Electric Power and Machines Engineering (Automatic Control)	Faculty of Engineering, Cairo University	December 2008
M.Sc.	Electric Power and Machines Engineering (Automatic Control)	Faculty of Engineering, Cairo University	August 2006
B.Sc.	Electric Power and Machines Engineering	Faculty of Engineering, Benha University (Shoubra)	July 2000

Employment Record:

1. From September 2016 till now, **Associate Professor**, Department of Electrical Engineering at Benha Faculty of Engineering, Benha University, Benha.
2. From September 2016 till now, **Deputy Director** of the Benha Faculty of Engineering Academic Quality Assurance and Accreditation Committee. She was also the Coordinator of the Academic Accreditation Committee review visit of April 2017.
3. From March 2015 till Sep. 2015, **Visiting Assistant Professor**, Dept. Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, Ohio, USA., immediate supervisor: **Professor Kenneth Loparo**, Nord Professor of Engineering and Chairman.
4. From January 2011 till August 2016, **Assistant Professor**, Department of Electrical Engineering at the Faculty of Engineering, Benha University, Benha.
5. From January 2009 till December 2010, **Research Associate**, Department of Electric Power and Machines Engineering, Cairo University (Supervisor Professor Hassen Dorrah). Work was directed toward conducting research in intelligent systems and fuzzy modeling (with application to smart grids).
6. From September 2009 till December 2011, **Lecturer**, Department of Computer Science, Higher Technological Institute in 10th of Ramadan City, Egypt, teaching Automatic Control, Operations Research, Electric Engineering, Information Technology and Computer Systems.
7. From January 2009 till August 2009, **Performance Evaluation Engineer**, the Egyptian Electricity Holding Company, Ministry of Electricity and Energy, Cairo Egypt.
8. From July 2008 till December 2008, **Director of Research and Development (R&D)**, SDA Engineering (Consultants) Inc, 98 El Tahrir Street, No. 409-410, Dokki Administration Building, Dokki Square, Giza, Egypt, 13211.
9. From October 2006 to June 2008, **Research Assistant (Part Time)**, Department of Electric Power and Machines, Faculty of Engineering, Cairo University.
6. From 2000 to June 2008, **Distribution Network Engineer**, North Cairo Electricity Distribution Company, Ministry of Electricity.

Consulting Experience:

Sharing **SDA Engineering (Consultants) Inc.** Consulting Teams in carrying out the following activities from January 2007 till now:

1. Development of New Systems' Consolidity Theory Using Arithmetic Fuzzy Logic-Based Representation in Fully Fuzzy Environment, with Research and Development Division, SDA Engineering Canada Inc., Toronto, Ontario, Canada, February 2010 till now. The project is directed towards applying the new concept of Systems' Consolidity to many applications in robotics and control.

2. Preparation of Master Plan for Pump Stations Rehabilitations and Improvement, Mechanical and Electrical Department, Ministry of Water Resources and Irrigation, October 2010 - June 2011. The Master Plan also includes the upgrading of the pump stations using intelligent instrumentations and Programmable Logic Controllers (PLCs) based control systems.
3. Development of Mechanical Workshop and Engineering Laboratories in the Mechanical and Electrical Department, Mechanical and Electrical Department, Ministry of Water Resources and Irrigation, October 2010 - June 2011. The project also includes the establishing of new Electronic Maintenance Laboratories for the repairing and maintenance of intelligent instruments and PLC components.
4. Technical and Financial Feasibility Study for Rehabilitations and Improvement of Pump Stations of the Mechanical and Electrical Department, Egyptian Ministry of Water Resources and Irrigation, July-October 2009. The project is directed towards carrying out comprehensive economical study for each selected pump station, by applying different levels of rehabilitations and overall improvement, and using different technical and financial feasibility indicators.
5. Implementation of Vision and Strategy Development of Institutional Reform of Ministry of Water Resources and Irrigation (Sponsored by GTZ Germany and Netherlands Royal Embassy Cairo, June 2008-May 2009. The purpose of this study to develop the institutional reform vision and strategy for the Ministry. Such strategy is based on participation, decentralization, and private sector participation.
6. Preparation of Terms of References for Improving the Performance of the Potable Water and Waste Water Holding Company and four Affiliated Companies (Sponsored by KfW Germany), March 2009. The project also includes upgrading the SCADA systems inside the Holding Company Stations.
7. Development of Vision and Strategy Development of New Cairo Region regarding Information Technology, facilities measurements and control (sponsored by Ministry of Housing and New Communities with Space Architects), August 2008 – May 2009. The project is based on building the information infrastructure strategy for data gathering from different operational utilities such as electricity, potable water, gas, ..etc.
8. Development of Public Private Partnership in Electric Pump Stations for the Mechanical and Electric Department, Ministry of Water Resources and Irrigation (Sponsored by the World Bank), January 2007 – July 2007. The project develops and recommends innovative alternatives ways and institutional setups for establishing Public Private Partnerships (PPP) in the irrigation sector

Industrial Experience:

Consolidity and Inhibitors (SDA Engineering Inc. Canada and Egypt – From February 2018 till now):

Inhibitors have a long history of use in psychiatry and neurology as mood stabilizers and anti-epileptics. More recently they are being investigated as possible treatments for cancers, HIV, parasitic and inflammatory diseases. **Consolidity** on the other hand provides an effective tool towards scrutinizing the inner behavior of systems and measures their ability to withstand changes when subjected to influences and affecting environment. Thus, Consolidity could provide the necessary mathematical platforms and tools for producing new profound generation of such medical inhibitors.

The purpose of this project is analyze selected highlights of “**Consolidity**” literature from the viewpoint of “Online Inhibitor” database to support researchers for achieving new consolidity-based advancement in this important inhibitors field.

Automation (SDA Engineering and Ministry of Water Resources and Irrigations – From July 2008 till Now)

Operating as a Control Engineer in a team for carrying out the following activities:

- a) Field Assessment of different existing PLC-based systems for determining their operational shortcomings and future needed requirements. Locations of stations are in West Delta, Sinai and Upper Egypt.
- b) Setting a standard modular PLC-based control design for upgrading 130 irrigation pump stations, including specifications of intelligent instrumentations, control panels, human machine interfaces (HMIs), ..etc.
- c) Designing systems Auto/Semi-Auto/Manual operations with necessary interlocking.
- d) Specifying quality assurance procedure for systems installation and commissioning.

Power Engineering (Ministry of Electricity – From 2000 to June 2008)

Working as Electric Power Engineer for carrying out the following activities in Great Cairo Electric Power Network:

- a) Power quality monitoring and control for distribution networks (Medium & Low Side Voltages).
- b) Team leader of power factor correction and compensation of reactive power in the Egyptian National Power Grid, Egyptian Electricity Holding Company.
- c) Power grid expansion for urban territories.
- d) Maintenance for power transformers and medium voltage cables.

Other Activities:

1. Coordinator of Education Quality Assurance and Accreditation Committee of Benha Faculty of Engineering, responsible of developing Academic Courses and their Curriculum Mappings.
2. Reviewer: (Elsevier Publisher) Fuzzy Sets and Systems.
3. Reviewer Scientific Research and Essays, Academic Journals.
4. Reviewer of Elsevier Alexandria Engineering Journal.
5. Reviewer of Elsevier Ain Shams Engineering Journal.
6. Member of the Organizing Committee of Fourteenth International Middle East Power Systems Conference (MEPCON'10), Cairo, Egypt, December 19-21, 2010, sponsored by IEEE and Cairo University.

Courses Taught:

1. Automatic Control Theory and Systems.
2. Electric circuit analysis
3. Robotics.
4. Energy and Renewable Energy Systems.
5. Smart Power Grids.
6. Electrical Measurements and Instrumentation.
7. Probability and Statistics with Applications.
8. Fuzzy Systems with Applications.
9. Global Optimization Techniques.
10. Operations Research.
11. Building Automation.
12. Engineering Economics.

Awards:

- Short-term Mission from Egyptian Ministry of Higher Education for working as an Visiting Assistant Professor, at the Dept. Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, Ohio, USA.
- Excellence award for extraordinary efforts in developing Academic Courses and their Curriculum Mappings, from the Dean of Benha Faculty of Engineering, 2014.

B. Sc. Graduation Projects (Cairo University and Benha University – 2008 to 2011)

Developing advanced building automation systems to various real life applications. These systems are designed using smart measurements and PLCs-based methodology for the purpose of monitoring, operation, control and troubleshootings of the systems. Other applications include security, protection, power saving, and other miscellaneous usages. The students carry out for their selected application the system requirements, design alternatives, instrumentation and wiring diagrams, PLCs systems specifications and programming, Human Machine Interface/Control Panels design, and overall installation procedures.

Computer Skills:

1. Proficiency in Microsoft office programs (Excel, Word, Power Point and Picture Manager).
2. Proficiency in AutoCAD.
3. Proficiency in MATLAB programming language, SIMULINK and tool boxes use.
4. Proficiency in C++ programming.
5. Proficiency in FORTRAN and Visual Basic programming.

Publications:

1. Hassen Taher Dorrah, Walaa Ibrahim Gabr, and Mohamed Saleh ElSayed," Generic symbolic parameters varying systems frameworks versus other techniques: Returning back to the roots", Alexandria Engineering Journal (AEJ, Elsevier), 2018, <https://doi.org/10.1016/j.aej.2017.11.021>, Article in press, December 2018, (<http://www.sciencedirect.com/science/article/pii/S1110016818301522>).
2. Walaa Ibrahim Gabr, Hassen Taher Dorrah, and Sara Atif El-Gendy, "Optimal Analysis of Flexible Reconfigurable Networks Using Movable and Changeable Components", Proceedings of 2018 Twentieth International Middle East Power Systems Conference (MEPCON'2018), Cairo University, Egypt, 18-20 December 2018, Paper No. 24, pp. 74-81, (IEEE Xplore Publication ISBN #978-1-386-6654-8).
3. Walaa Ibrahim Gabr, Mahmoud Mohamed El Bahy and Muhammad Taha Eissa, Spatial and Capacity Optimization of Small and Medium Renewable Energy Grids for Remote Areas With Application, Proceedings of 2018 Twentieth International Middle East Power Systems Conference (MEPCON'2018), Cairo University, Egypt, 18-20 December 2018, Paper No. 65, pp. 233-240 (IEEE Xplore Publication ISBN #978-1-386-6654-8).
4. Walaa Ibrahim Gabr and Waleed Abdelaziz Salem, Impact of Grid Connected Photovoltaic System on Total Harmonics Distortion (THD) of Low Voltage Distribution Network: A Case Study, Proceedings of 2018 Twentieth International Middle East Power Systems Conference (MEPCON'2018), Cairo University, Egypt, 18-20 December 2018, Paper No. 152, pp. 630--637 (IEEE Xplore Publication ISBN#978-1-386-6654-8).
5. Hassen Taher Dorrah, Walaa Ibrahim Gabr, and Mohamed Saleh ElSayed," Derivation of symbolic-based embedded feedback control stabilization with experimentation", Paper # S2.5, IEEE-ACCS/PEIT' 2017 Conference, Alexandria Egypt, 5-8 November 2017, also accepted for publication in Journal of Electrical Systems and Information Technology (JESIT, Elsevier), 2018.

6. Ahmed Nori Alshawish, Walaa Ibrahim Gabr, Saad Eskander, Salah Ghazy Mohamed, "DC-DC converter operates as a maximum power point voltage tracker", *MANSOURA ENGINEERING JOURNAL, (MEJ)*, VOL. 43, ISSUE 1, MARCH 2018.
7. Walaa Ibrahim Gabr, "Quadratic and Nonlinear Programming Problems Solving and Analysis in Fully Fuzzy Environment", *Elsevier Alexandria Engineering Journal* 2015, doi: 10.1016/j.aej.2015.03.020, September 2015, [and also, *AEJ* 2015; 54(3):457-472].
8. Walaa Ibrahim Gabr, "A Novel Approach for System Change Pathway Analysis Using Consolidity Charts", *Elsevier Ain Shams Engineering Journal* 2015, doi: 10.1016/j.asej.2015.03.004, April 2016, [and also, *ASEJ* 2016; 7(1):293-311].
9. Walaa Ibrahim Gabr, "A new approach for automatic control modeling, analysis and design in fully fuzzy environment", *Elsevier Ain Shams Engineering Journal* 2015, doi: 10.1016/j.asej.2015.01.010, [and also, *ASEJ* 2015; 6(3):835-850].
10. Walaa Ibrahim Gabr, "Consolidity analysis of fuzzy functions, matrices, probability and statistics,". *Elsevier Ain Shams Engineering Journal* 2014, doi: 10.1016/j.asej.2014.09.014, [and also, *ASEJ* 2015; 6(1):181-197].
11. Walaa Ibrahim Gabr, "Analogy between Arithmetic Fuzzy Logic-based Representation Approach and Conventional Fuzzy Theory with Applications to Operations Research", *Journal of Al Azhar University Engineering Sector (JAUES)*, Vol. 10, No. 35, April 2015, pp. 634-650.
12. Hassen Taher Dorrah, "Walaa Ibrahim Gabr. Development of new Consolidity Theory for Systems' Analysis and Design in Fully Fuzzy Environment", *International Journal of Expert Systems with Applications* 2011, doi:10.1016/j.eswa.2011.07.125, [and also *ESWA* 2012; 39(1): 1191-1199].
13. Hassen Taher Dorrah and Walaa Ibrahim Gabr," Foundations of New Systems' Consolidity Theory Using Arithmetic Fuzzy Logic-Based Representation in Fully Fuzzy Environment", *Proceedings of 6th Annual IEEE Conference on Automation Science and Engineering (IEEE CASE)*, Toronto, Ontario, Canada, August 21-24, 2010, Paper No. MoC2.1, pp. 624-631.
14. Hassen Taher Dorrah and Walaa Ibrahim Gabr, "New Approach for Automatic Control Modeling and Analysis Using Arithmetic and Visual Fuzzy Logic-based Representations in Fully Fuzzy Environment", *Proceedings of IEEE International Conference on Information and Automation*, Harbin, Heilongjiang, China, June 20-23, 2010, Paper No. 1031741, pp. 605-612.

15. Walaa Ibrahim Gabr, "Arithmetic Fuzzy Logic-based Representation Approach versus Conventional Fuzzy Theory for Modeling and Analysis in Fully Fuzzy Environment", *Proceedings of IEEE International Conference on Information and Automation*, Harbin, Heilongjiang, China, June 20-23, 2010, Paper No. 1031751, pp. 637-643.
16. Hassen Taher Dorrah and Walaa Ibrahim Gabr, "Generalization of Arithmetic and Visual Fuzzy Logic-based Representations for Nonlinear Modeling and Optimization in Fully Fuzzy Environment," *Proceedings of IEEE International Conference on Robotics and Biomimetics*, (ROBIO 2009), December 18-22, 2009, Guilin, Guangxi, China, pp. 1013-1020.
17. Hassen Taher Dorrah and Walaa Ibrahim Gabr, "Development of Fuzzy Logic-based Arithmetic and Visual Representations for Solving Quadratic Programming in Fully Fuzzy Environment" 2009 *Proceedings of IEEE International Conference on Information and Automation*, Zhuhai, China, 22-24 June 2009, pp. 46 – 53.
18. Hassen Taher Dorrah and Walaa Ibrahim Gabr and Multi-Objective Linear Optimization Using Fuzzy Logic-based Arithmetic and Visual Representations with Forward and Backward Tracking", *Proceedings of IEEE International Conference on Robotics and Biomimetics*, Bangkok, Thailand, 22-25 Feb. 2009, pp 731 – 738.
19. Walaa Ibrahim Gabr and Hassen Taher Dorrah, "Development of Fuzzy Logic-based Arithmetic and Visual Representations for Systems' Modeling and Optimization of Interconnected Networks", *Proceedings of IEEE International Conference on Robotics and Biomimetics*, Bangkok, Thailand, 22-25 Feb. 2009, pp 723 – 730.
20. Walaa Ibrahim Gabr and Hassen Taher Dorrah, "New Fuzzy Logic-based Arithmetic and Visual Representations for Systems' Modeling and Optimization," *Proceedings of IEEE International Conference on Robotics and Biomimetics*, Bangkok, Thailand, 22-25 Feb. 2009, pp 715 – 722.

Note: Based on the **Global Science Gateway** (www.worldwidescience.org), the Papers Number 8, 9, 10, and 12 have also appeared in the Chinese, French, German, Japanese, Portuguese, Spanish, Sweden, Russian languages.

Languages:

Language	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Arabic	Excellent	Excellent	Excellent
French	Basic	Basic	Basic

References

1. Dr. Hassen Taher Dorrah, Professor of Electrical Engineering, Cairo University, Giza, Egypt, mail: dorrahht@aol.com, mobile: +(20)-1222189739.
2. Dr. Ahmed ElGarhy, Dean of Faculty of Engineering, Helwan University, Helwan, Cairo, mail: agarhy2003@yahoo.co.in, mobile:+(20)-01001408908.
3. Dr. Said Abdel Monem Wahsh, Professor of Industrial Electronics, Electronic Research Institute, National Research Center, mail: wahsh@eri.sci.eg, mobile: +(20)-1223745184.

Short Biography

Dr. Walaa Ibrahim Gabr received her B. Sc. in Electrical Engineering from Benha University (Shoubra Faculty), Egypt in year 2000, and the M. Sc. and Ph. D. Degrees in Automatic Control from Cairo University, Egypt, in 2006 and 2008 respectively. She is currently an Associate Professor of Electrical Engineering, Benha Engineering Faculty, Benha University, Egypt. Since March 2015, she is also a Visiting Assistant Professor with the Dept. of Electrical Engineering and Computer Science, Case Western Reserve University (Cleveland, Ohio, USA).

From 2009 till 2010, she worked as a R&D Senior Consultant with SDA Engineering Canada Inc. (Toronto, Ontario, Canada) in the area of intelligent systems and their applications. Since September 2016 till now, she was serving as the Deputy Director of the Benha Faculty of Engineering Academic Quality Assurance and Accreditation Committee. She was also the Coordinator of the Academic Accreditation Committee review visit of April 2017.

In year 2010, she developed jointly with Dr. Hassen Taher Dorrah (Cairo University) the new concept of “*Consolidity Theory*” as one of the inner properties of both *natural* and *man-made* systems and shared with him most of its following research works and advancements. Her core publications in Consolidity have also have also appeared in the Chinese, French, German, Japanese, Portuguese, Spanish, Sweden, Russian languages.

Her main interests are systems engineering, automatic control, robotics, robust systems design, intelligent systems, energy and renewable energy systems, probability and statistics with applications, information theory, fuzzy systems, optimization techniques, operations research, Engineering economics, and smart power grids.