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**Electrical Power and Machines Department
Faculty of Engineering, Ain Shams university
1 El-Sarayt St., Abdo Basha sq., Abbassya,
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CAREER SUMMARY

Solid practical and academic experience in power electronics and electric power systems. Projects have covered renewable energy interfacing systems, electric drives, power electronic converters, EV chargers, power quality and custom power, distributed energy resources, DSP techniques for detection and classification of disturbances, artificial intelligent applications in power systems, and digital control based on micro-controllers and DSP. Familiar with different software packages used for power system simulation. Strong knowledge of experimental and measurement techniques.

EDUCATION

- 2001– 2004 • **Ph.D** Electrical and Computer Engineering Department, University of Waterloo, Canada.
Thesis: Novel control algorithms for inverter-based custom power conditioners.
Graduate Courses: Energy Processing, DC & Flexible AC Transmission, High Voltage Engineering Applications, Multivariable Control Systems, Adaptive control, and Distribution Systems Engineering. *Overall average 95%.*
- 1998 – 2000 • **M.Sc.** Electrical Power and Machines Department, Ain Shams University, Cairo, Egypt.
Thesis: Intelligent AC Drive.
Graduate Courses: Control system in electrical machines, Transient process in linear systems, Renewable energy sources for electricity generation, and Microprocessor applications in electric power and machines. *Overall average A⁺.*
- 1992 – 1997 • **B.Sc.** Electrical Power and Machines Department, Ain Shams University, Cairo, Egypt.
Project: Micro controller based IGBT DC drive.
Rank: 1st in an 80-student class.
Cumulative Grade: Distinction with honor degree.

WORK EXPERIENCE

- May 2023 - present **Director**, Center of Excellence for Energy (CoE/E), Faculty of Engineering, Ain Shams University, Cairo, Egypt.
- Sept. 2017-August 2020 **Visiting Professor** Arab Academy for Science, Technology & Maritime Transport, College of engineering and technology, Cairo, Egypt.
- Oct 2016 - present **Professor** Ain Shams university, Faculty of Engineering, Electrical power and Machines Dept.
- Feb. 2014-Jan2015 **Visiting Associate Professor** Arab Academy for Science, Technology & Maritime Transport, College of engineering and technology.
- June 2011-Jan 2014 **Associate Professor** Ain Shams university, Faculty of Engineering, Electrical power and Machines Dept.
- Feb 2015-Sept 2016 **Associate Professor** Ain Shams university, Faculty of Engineering, Electrical power and Machines Dept.
- Winter term of 2009/2010 **Founding Unit head** of Energy & Renewable Energy (ERGY) undergraduate program at Ain Sham University.
- April 2006 – June 2011 **Assistant Professor**,
- Ain Shams university, Faculty of Engineering, Electrical power and Machines Dept.
 - Part time at the Arab Academy for Science, Technology & Maritime Transport, College of engineering and technology; Starting at Sept. 2006.
 - Part time at the French University in Egypt (UFE); 2007/2008.
 - Part time at the British University in Egypt (BUE); Feb. 2008 to August 2011.
- May 2004 – April 2006 **Post doctoral fellow**, University of Waterloo, Electrical & Mechanical Engineering Departments, Canada. (NSERC grant)

Prof. Mostafa I. Marei

Apr 2003 – Mar 2004	Research Associate , Electrical & Mechanical depts., University of Waterloo, Ontario, Canada.
Sept 2001 – Apr 2004	Teaching Assistant , University of Waterloo, Electrical and Computer Engineering Department, Canada.
May 2001 – Mar 2004	Research Assistant , University of Waterloo, Electrical and Computer Engineering Department, Canada. (NSERC grant)
Mar 2000 – Apr 2001	Assistant Lecturer , Ain Shams University, Electric Power and Machines Department.
Jan 99 – Apr 2001	Design engineer , part time at many consultant offices, Cairo, Egypt.
Dec 98 – Apr 2001	Research Assistant , Ain Shams University, Electric Power and Machines Dept., Egypt.
Dec 98 – Mar 2000	Demonstrator , Ain Shams University, Electric Power and Machines Department.
Oct 97 – Dec 98	Engineer , Egyptian Armed Forces.

Research Areas

- Power electronics.
- Renewable energy systems (Photovoltaic, Wind, and Wave).
- Distributed generation.
- Microgrids
- DC grids.
- Power quality and custom power.
- Electric drives and hybrid electric vehicles.
- Artificial intelligent and digital signal processing applications in power systems and electric drives.

SCHOLARSHIPS & AWARDS

December 2022	• Shield of the Graduates Association of the Faculty of Engineering - Ain Shams University to honor scholars who hold scientific production awards.
October 2022	• Listed in the world's top 2% scientists list by Stanford University (V4).
June 2014	• 2013 - Encouraging State Prize (State Incentive Award) in Engineering Sciences-Academy of Scientific Research and Technology - Egypt.
June 2013	• Shield of Faculty of engineering - Ain Shams University to honor young researchers seeking the Department of Power and Electrical Machines Engineering.
August 2012	• My biography is listed in the 2013 Edition of Marquis Who's Who in the World.
2008 to 2019	• International publications award from Ain Shams University (15 times).
August 2008	• My biography is listed in the 2009 Edition of Marquis Who's Who in the World.
May 2004 – April 2006	• Natural Sciences and Engineering Research of Canada (NSERC): Post-Doctoral Fellowship funded by the Canadian Government.
May 2003 – April 2004	• Ontario Graduate Scholarship.
May 2001 – April 2003	• University of Waterloo, Canada, E&CE Graduate Scholarship.
Sept. 2001– Sept. 2003	• Faculty of Engineering Scholarship (FOE), University of Waterloo (5 times)
June 2002	• Travel Grant Award – IEEE PES summer meeting, Chicago, USA.
June 2003	• Travel Grant Award – IEEE Power Electronic Specialist conference (PESC), Acapulco, MÉXICO.
1997	• Medal of Academic Distinction, Ain Shams University, Cairo, Egypt

PROFESSIONAL ACTIVITIES AND SERVICES

- [1] Vice Chair of Egypt Section Chapter of the IEEE Power Electronics Society (PELS) since 2018.
- [2] Reviewer for the Academic Promotion, Ajman, UAE, 2022
- [3] Reviewer for the Academic Promotion, King Abdulaziz University, Saudi Arabia, 2020
- [4] Reviewer for the Permanent Committee for Academic Promotion, Supreme Council of Universities, Egypt since 2020
- [5] Reviewer for Science and Technological Development Fund (STDF), Egyptian Ministry for Scientific Research, since 2015.
- [6] Reviewer for funded projects offered by Information Technology Academia Collaboration (ITAC), Information Technology Industry Development Agency (ITIDA), since 2017.
- [7] Responsible for preparing a new undergraduate credit hour program at the Faculty of engineering, Ain Shams university entitled “Energy and Renewable Energy” in cooperation with the Technical University of Clausthal, Germany. The program is started at 2009 and I was the first director for it.
- [8] **Member in the editorial board**
Electric Power Components and Systems Journal
Engineering Ain Shams Journal
Guest Editor of a special issue in Applied Sciences Journal
- [9] **Track chair for the following international conferences:**
IEEE Conference on Power Electronics and Renewable Energy (CPERE), Luxor, Egypt, 19-21 Feb. 2023
23rd IEEE Middle East Power System Conference (MEPCON), Kafrelsheikh University, Cairo, Egypt, 13-15 Dec. 2022.
22nd EPE Energy Conversion Congress and Expo (EPE-ECCE), Lyon, France, 7-11 Sept. 2020.
IEEE Conference on Power Electronics and Renewable Energy (CPERE), Aswan, Egypt, 23-25 Oct. 2019
21th EPE Energy Conversion Congress and Expo (EPE-ECCE), Genova, Italy, 2-5 Sept. 2019.
19th IEEE Middle East Power System Conference (MEPCON), Menoufia University, Cairo, Egypt, 19-21 Dec. 2017.
- [10] **Reviewer for the following international journals:**
IEEE Transactions on Power Electronics.
IEEE Transactions on Industrial Electronics.
IEEE Journal of Emerging and Selected Topics in Power Electronics.
IEEE transaction on Smart Grid.
IEEE Transactions on Power Delivery.
IEEE Transactions on Power System.
IEEE transaction on Energy Conversion.
IEEE transaction on Sustainable Energy.
IEEE Systems Journal
IEEE ACCESS
IEEE Journal of Photovoltaics
CSEE Journal of Power and Energy Systems
IET Generation, Transmission, and Distribution.
IET Renewable Power Generation.
IET Power Electronics.
IET Energy Systems integration
IETE Journal of research
IETE Technical Review
The International Journal of electric power and energy systems (Elsevier).
Electric Power System Research (Elsevier).
Renewable energy (Elsevier).
Applied Energy (Elsevier).
Renewable & Sustainable Energy Reviews (Elsevier).
International Journal of Electronics
International Journal of Circuit Theory and Applications

Energy reports (Elsevier).
Energy Storage (Elsevier).
Energies
Energy sources part A
The International Journal of Electric Power Components and Systems (Taylor and Francis).
International Transactions on Electrical Energy Systems
Ain Shams Engineering Journal (Elsevier)
Journal of Electrical Systems and Information Technology (Elsevier)
Journal of Circuits, Systems and Computers
International Journal of Power Electronics and Drive System
International Journal of Numerical Modelling
International Journal of Photoenergy
Frontiers of Information Technology & Electronic Engineering (Springer)
International Research Journal of Engineering Science, Technology and Innovation
Scientific Research and Essays.
International Journal of Emerging Electric Power System (De Gruyter)

Reviewer for the following international conferences:

IEEE Applied Power Electronic Conference (APEC04), 22 - 26 Feb. 2004, Anaheim, CA, USA
IEEE Applied Power Electronic Conference (APEC05), 6 – 10 Mar. 2005, Austin, TX, USA.
International Conference on Electric Power and Energy Conversion (EPECS09), Nov.10-12, 2009, Sharjah, UAE.
International Conference on Electric Power and Energy Conversion (EPECS11), Nov.15-17, 2011, Sharjah, UAE.
IEEE Canadian Conference of Electrical and Computer Engineering (CCECE12), Apr. 29-May 2, 2012, Montréal.
International Middle East Power System Conference (MEPCON15), Dec. 23-25, 2012, Alexandria, Egypt.
International Conference on Electric Power and Energy Conversion 2013 (EPECS13), 2-4 Oct. 2013, Istanbul, Turkey.
International Middle East Power System Conference (MEPCON16), Dec. 23-25, 2014, Cairo, Egypt.
IEEE GCC Conference and Exhibition - Towards Smart Sustainable Solutions, 1-4 Feb. 2015, Muscat, Oman.
4th International Conference on Electric Power and Energy Conversion Systems (EPECS'15), Nov. 24-26, 2015, Sharjah, UAE.
FUE International Conference on New Energy and Environmental Engineering (ICNEEE), 11-14 April 2016, Cairo, Egypt.
16th IEEE Int. Conf. on Environment and Electrical Engineering (IEEE-EEEIC2016), 7-10 June 2016, Florence, Italy.
5th International Conference on Electric Power and Energy Conversion Systems (EPECS'18) , 23-25 April, 2018, Japan.

- [11] Member of the Scientific Council of Ain Shams University: 2015-2017.
- [12] Member of the Technical Program Committee of the IEEE Conference on Power Electronics and Renewable Energy (CPERE), Aswan, Egypt, 23-25 Oct. 2019.
- [13] Member of the Technical Program Committee of the 5th International Conference on Electric Power and Energy Conversion Systems (EPECS'18), Kitakyushu, Japan, April 23-25, 2018.
- [14] Member of the Technical Program Committee of the 4th International Conference on Electric Power and Energy Conversion Systems (EPECS'15), Sharjah , UAE, November 24-26, 2015
- [15] Member of the Technical Program Committee of the 16th International Middle East Power System Conference (MEPCON 2014)
- [16] Reviewer of the book titled “Programmable logic control” for third-year industrial-secondary schools, Ministry of Education, Cairo, Egypt, 2011-2013.
- [17] Member of the Technical Program Committee of the 2nd International Conference on Electric Power and Energy Conversion Systems (EPECS'11), Sharjah , UAE, November 15-17, 2011
- [18] Reviewer of the following standards for the “Egyptian Organization for Standardization and Quality”:
a) 2011/7399 تصنيف مواد الفرايت ذات النفاذيه المغناطيسييه العاليه
b) 2011/7459 القلوب المصنعه من مواد مغناطيسييه ذات نفاذيه عاليه طرق القياس الخواص المغناطيسييه عند مستوى اثاره عال
The review process is done through the Electrical Power and Machines department, Faculty of Engineering, Ain Shams University.
- [19] Reviewer of the electrical wiring for the project of developing a data center for the National Authority for

- Remote Sensing, Engineering consulting center, Faculty of engineering, Ain Shams University (2011 to 2013)
- [20] Head of the editing and publishing committee of the Third Ain Shams University International Conference on Environmental Engineering, Cairo, Egypt, 2009. Also, I was participating in the technical and general management committees.
- [21] Member in a team for preparing a proposal for a joint graduate program with Cologne University for Applied Sciences (CUAS), Cologne, Germany, 2007-2008.
- [22] Referee for the Egyptian Engineering Day (EED), Cairo, Egypt, 1-3 August 2009.
- [23] Head of the editing and publishing committee of the First Ain Shams University International Conference on Environmental Engineering, Cairo, Egypt, Second. Also, I was participating in the technical and general management committees.
- [24] Secretary of the departmental meeting (EPM dept., Faculty of Engineering) during the academic year 2006/2007.
- [25] Team leader of students group participated in the ROBOCON contest 2007, Cairo.
- [26] Designer of an electric vehicle prototype under cooperation with the Mechanical Engineering Dept., University of Waterloo (started from April 2003). The project is funded from AUTO21/ NSERC, Canada.
- [27] Designer of a Digital Signal Processor (DSP) board, University of Waterloo (Aug 2003).
- [28] Designer of many microcontrollers boards using Intel 8051 and PIC for digital control of power electronic converters for industrial applications (started from 1997).

PROFESSIONAL MEMBERSHIPS

- Senior Member; Institute of Electrical and Electronics Engineers (IEEE), 1997 to present.
- Member; Science of Automation Engineering (SAE), 2003-2006.
- Member; Egyptian Syndicate of Engineers (ESE), 1997 to present.

PUBLICATIONS

	Principal Author	Co-Principal Author	Total
Peer-reviewed Journals	26	54	80
Peer-reviewed Conference Proceedings	17	67	83
Thesis	2	65	67
Books	-	1	1

REFEREED JOURNAL PUBLICATIONS

- [J1] **M. I. Marei**, E.F. El-Saadany, and M. M. A. Salama, "A Novel Control Algorithm for the DG Interface to Mitigate Power Quality Problems," *IEEE Transactions on Power Delivery*, Vol. 19, No. 3, July 2004, pp. 1384 - 1392. DOI: 10.1109/TPWRD.2004.829922
- [J2] **M. I. Marei**, E. F. El-Saadany, and M. M. A. Salama, "A Processing Unit for Symmetrical Components and Harmonics Estimation Based on a New Adaptive Linear Combiner Structure," *IEEE Transactions on Power Delivery*, Vol. 19, No. 3, July 2004, pp. 1245 - 1252. DOI: 10.1109/TPWRD.2004.829110
- [J3] **M. I. Marei**, E.F. El-Saadany, and M.M.A. Salama, "Envelope Tracking Techniques for Flicker Mitigation and Voltage Regulation," *IEEE Transactions on Power Delivery*, Vol. 19, No.4, Oct. 2004, pp. 1854-1861. DOI: 10.1109/TPWRD.2004.835050
- [J4] **M. I. Marei**, E.F. El-Saadany, and M. M. A. Salama, "Estimation Techniques for Voltage Flicker Envelope Tracking," *Electric Power Systems Research Journal (Elsevier)*, Vol. 70, June 2004, pp. 30-37. DOI: 10.1016/j.epr.2003.11.001
- [J5] **M. I. Marei**, E. F. El-Saadany, and M. M. A. Salama, "A Novel Current Regulated PWM Technique for ADALINE based Active Power Line Conditioner," *International Journal of Engineering Intelligent systems for Electrical Engineering & Communication (IJEIS), UK*, Vol. 12, No. 2, 2004, pp. 127- 134.
- [J6] **M. I. Marei**, T. K. Abdel-Galil, E. F. El-Saadany, and M. M. A. Salama, "Hilbert Transform Based Control Algorithm of the DG Interface for Voltage Flicker Mitigation," *IEEE Transactions on Power Delivery*, Vol.

- 20, No. 2, April 2005, pp. 1129-1133. DOI: 10.1109/TPWRD.2004.843461
- [J7] **M. I. Marei**, E. F. El-Saadany, and M. M. A. Salama, "A New Approach to Control DVR based on Symmetrical Components Estimation," *IEEE Transactions on Power Delivery*, Vol. 22, No. 4, Oct. 2007, pp. 2017-2024. DOI: 10.1109/TPWRD.2007.905537
- [J8] **M. I. Marei** and R. El-Shatshat, "Fast Envelope Estimation Technique for Monitoring Voltage fluctuations," *Journal of Electrical Engineering & Technology (JEET)*, Vol. 2, No. 4, 2007, pp. 445- 451. DOI: 10.5370/JEET.2007.2.4.445.
- [J9] A. M. Ibrahim, **M. I. Marei**, M. M. Mansour, and S. F. Mekhamer, "ANN-Based Approach Using TLS-ESPRIT for Protection of Series Compensated (TCSC) Transmission Lines," *The Scientific Bulletin, Faculty of Engineering, Ain Shams University*, Vol. 42, No. 2, June 2007, pp. 767-783.
- [J10] I. El-samahy, **M. I. Marei**, and E. F. El-Saadany, "Modeling of a Four-Quadrant Switched Reluctance Motor Drive on EMTDC/PSCAD," *Journal of Electrical Engineering & Technology (JEET)*, Vol. 3, No. 1, 2008, pp. 68- 78. DOI: 10.5370/JEET.2008.3.1.068
- [J11] Y. Montasser, **M. I. Marei**, and S. H. Jayaram, "Low-Power High-Voltage Power Modulator for Motor Insulation Testing," *IEEE Transactions on Industry Applications*, Vol. 44, No. 4, July/Aug 2008, pp. 1059- 1066. DOI: 10.1109/TIA.2008.926234
- [J12] A. A. El-Sattar, **M. I. Marei**, and E. A. Mahmoud, "A new sensorless control scheme for medium voltage drive based on induction motor," *Ain Shams Journal of Electrical Engineering (ASJEE)*, Vol. 2, Dec. 2008, pp. 109-118.
- [J13] **M. I. Marei**, A. A. El-Sattar, and E. A. Mahmoud, "A comparison between reduced order kalman filters and a recursive least square algorithm for sensorless induction motor drive," *Ain Shams Journal of Electrical Engineering (ASJEE)*, Vol. 1, June 2009, pp. 215-226.
- [J14] **M. I. Marei**, M. F. Shaaban, and A. A. El-Sattar, "A speed estimation unit for induction motors based on adaptive linear combiner," *Energy Conversion and Management (Elsevier)*, Vol. 50, No. 7, July 2009, pp. 1664 – 1670. DOI: 10.1016/j.enconman.2009.03.028
- [J15] M. H. Soliman, **M. I. Marei**, M. M. Mansour, and A. M. A. Mahmoud, "Stability improvement of distribution networks using inverter-based distributed generators at different modes of operation," *Ain Shams Journal of Electrical Engineering (ASJEE)*, Vol. 2, Dec. 2009, pp. 349-360.
- [J16] **M. I. Marei**, E. F. El-Saadany, and M. M. A. Salama, "Experimental evaluation of envelope tracking techniques for voltage disturbances," *Electric Power Systems Research (Elsevier)*, Vol. 80, No. 3, March 2010, pp. 339 – 344. DOI: 10.1016/j.epsr.2009.09.017
- [J17] **M. I. Marei**, A. A. El-Sattar, and E. A. Mahmoud, "Reduced order models for speed estimation of sensorless induction motor drives based on kalman filter and rls algorithm," *International Journal of Engineering Intelligent systems for Electrical Engineering & Communication (IJEIS)*, Vol. 18, No. 1, March 2010, pp. 25-33.
- [J18] **M. I. Marei**, "A unified interface system for high-speed generators based on a current controlled matrix converter," *Ain Shams Journal of Electrical Engineering (ASJEE)*, Vol. 2, Dec. 2010, pp. 45-56.
- [J19] A. M. Ibrahim, **M. I. Marei**, M. M. Mansour, and S. F. Mekhamer, "An artificial neural network based protection approach using total least square estimation of signal parameters via the rotational invariance technique for flexible AC transmission system compensated transmission lines," *Electric Power Components and Systems*, Vol. 39, Issue 1, 2011, pp. 64-79. DOI: 10.1080/15325008.2010.513363
- [J20] **M. I. Marei**, I. Abdallah, and H. Ashour, "Transformerless uninterruptible power supply with reduced power device count," *Electric Power Components and Systems*, Vol. 39, Issue 11, Jan. 2011, pp. 1097-1116. DOI: 10.1080/15325008.2011.559187
- [J21] **M. I. Marei**, A. B. Eltantawy, and A. A. El-Sattar, "An energy optimized control scheme for a transformerless DVR," *Electric Power Systems Research (Elsevier)*. Vol. 83, No. 1, Feb. 2012, pp. 110 – 118. DOI: 10.1016/j.epsr.2011.09.015
- [J22] **M. I. Marei**, E. F. El-Saadany, and M. M. A. Salama, "A flexible DG interface based on a new RLS algorithm for power quality improvement," *IEEE Systems Journal*, Vol. 6, Issue 1, Mar. 2012, pp. 68-75. DOI: 10.1109/JSYST.2011.2162930
- [J23] **M. I. Marei** and H. S. K. El-Goharey, "Modeling and Dynamic Analysis of Gearless Variable-Speed Permanent Magnet Synchronous Generator Based Wind Energy Conversion System," *Renewable Energy and Power Quality Journal (RE&PQJ)*, No. 10, April 2012, pp. 1597-1602. DOI: 10.24084/repqj10.773. *International Conference on Renewable Energies and Power Quality (ICREPQ)*, March 28-30, 2012, Santiago de Compostela, Spain.
- [J24] **M. I. Marei**, "A unified control strategy based on phase angle estimation for matrix converter interface

- system," *IEEE Systems Journal*, Vol. 6, No. 2, June 2012, pp. 278-286.
DOI: 10.1109/JSYST.2011.2163010
- [J25] H. S. El-Goharey, **M. I. Marei**, and M. G. S. Zaghloul, "Low Voltage Ride Through Characterization of Wind Energy Conversion Systems," *Renewable Energy and Power Quality Journal (RE&PQJ)*, No. 11, Mar 2013, pp. 1178-1183. DOI: 10.24084/repqj11.570
International Conference on Renewable Energies and Power Quality (ICREPQ), March 20-22, 2013, Bilbao, Spain.
- [J26] S. A. M. Shehata, H. S. El-Goharey, **M. I. Marei**, A. K. Ibrahim, "Detection of Induction Motors Rotor/Stator Faults Using Electrical Signatures Analysis," *Renewable Energy and Power Quality Journal (RE&PQJ)*, No. 11, Mar 2013, pp. 382-387. DOI: 10.24084/repqj11.318
International Conference on Renewable Energies and Power Quality (ICREPQ), March 20-22, 2013, Bilbao, Spain.
- [J27] **M. I. Marei** and M. H. Soliman "A coordinated voltage and frequency control of inverter based distributed generation and distributed energy storage system for autonomous microgrids," *Electric Power Components and Systems*, Vol. 41, Issue 4, Feb. 2013, pp. 383-400. DOI: 10.1080/15325008.2012.749550
- [J28] O. El-Nakeeb, **M. I. Marei**, and A. A. El-Sattar "A high frequency modular resonant converter for the induction heating," *International Journal of Emerging Technology and Advanced Engineering*, Vol. 3, Issue 2, 2013, pp. 432-438.
- [J29] **M. I. Marei**, M. M. Abdelmageed, and A. M. Asaad, "A simple adaptive control technique for shunt active power filter based on clamped-type multilevel inverters," *Consumer Electronics Times*, Vol. 2, Issue 2, 2013, pp. 85-95.
- [J30] **M. I. Marei**, M. A. Allam, and A. A. El-Sattar "A Simple Control Scheme for the High Performance Z-Source Inverter," *Electric Power Components and Systems*, Vol. 42, Issue 14, Oct. 2014, pp. 1623-1631. DOI: 10.1080/15325008.2014.943440
- [J31] **M. I. Marei**, N. El-Sayad, and A. A. El-Sattar "PV interface system with LVRT capability based on a current controlled HFAC link converter," *Sustainable Energy Technologies and Assessments (Elsevier)*, Vol. 9, Mar. 2015, pp. 55-62. DOI: 10.1016/j.seta.2014.12.006
- [J32] **M. I. Marei**, M. Mokhtar, and A. A. El-Sattar "MPPT Strategy based on Speed Control for AWS-based Wave Energy Conversion System," *Renewable Energy (Elsevier)*, Vol. 83, Nov. 2015, pp. 305-317. DOI: 10.1016/j.renene.2015.04.039
- [J33] **M. I. Marei**, A. Mohy, and A. A. El-Sattar "An Integrated Control System for Sparse Matrix Converter Interfacing PMSG with the Grid," *International Journal of Electrical Power & Energy Systems (Elsevier)*, Vol. 73, Dec. 2015, pp. 340-349. DOI: 10.1016/j.ijepes.2015.05.022
- [J34] H. Y. Diab, **M. I. Marei**, and S. Tennakoon, "Operation and control of an insulated gate bipolar transistor-based current controlling device for power flow applications in multi-terminal high-voltage direct current grids," *IET Power Electronics*, Vol. 9, No. 2, February 2016, pp. 305 –315. DOI: 10.1049/iet-pel.2015.0525
- [J35] M. Abdelsalam, **M. I. Marei**, S. Tennakoon, and A. Griffiths, "Capacitor Voltage Balancing Strategy Based on Sub-module Capacitor Voltage Estimation for Modular Multilevel Converters," *IEEE-CSEE Journal of Power and Energy Systems*, Vol. 2, No.1, March 2016, pp. 65-73.
- [J36] **M. I. Marei**, H. S. K. El-Goharey, R. M. Toukhy "Fault ride-through enhancement of fixed speed wind turbine using bridge-type fault current limiter," *Journal of Electrical Systems and Information Technology (Elsevier)*, Vol. 3, No. 1, May 2016, pp. 119-126.
- [J37] H. M. El-Helw, M. Al-Hasheem, and **M. I. Marei**, "Control strategies for the DAB based PV interface system," *PLoS ONE*, Vol. 11, No. 8, August 2016, pp. 1-19. DOI: 10.1371/journal.pone.0161856
- [J38] H. Y. Diab, **M. I. Marei**, and S. Tennakoon, "A Reduced Switch Count Topology of Current Flow Control Apparatus for MTDC Grids," *Journal of Power Electronics (JPE)*, Vol. 16, No. 5, September 2016, pp. 1743-1751. DOI: 10.6113/JPE.2016.16.5.1743
- [J39] S. Mansour, **M. I. Marei**, A. A. El-Sattar, "Droop based Control Strategy for a Microgrid," *Global Journal of Researches in Engineering :F*, Vol. 16, Issue 7, 2016, pp. 1-8. DOI: 10.17406/GJRE
- [J40] M. Abdelsalam, **M. I. Marei**, and S. Tennakoon, "An Integrated Control Strategy with Fault Detection and Tolerant Control Capability Based on Capacitor Voltage Estimation for Modular Multilevel Converters," *IEEE Transactions on Industry Applications*, Vol. 53, No. 3, May/June 2017, pp. 2840-2851. DOI: 10.1109/TIA.2016.2608940
- [J41] H. M. El-Helw, A. Magdy, and **M. I. Marei**, "A Hybrid Maximum Power Point Tracking Technique for

- Partially Shaded Photovoltaic Arrays," *IEEE Access*, Vol. 5, July 2017, pp. 11900-11908. DOI: 10.1109/ACCESS.2017.2717540
- [J42] M. Abdelsalam, **M. I. Marei**, S. A. Tennakoon, H. Y. Diab, "A Fault Tolerant Control Technique for Hybrid Modular Multi-Level Converters with Fault Detection Capability," *Journal of Power Electronics (JPE)*, Vol. 18, No. 2, March 2018, pp. 558-572. DOI: 10.6113/JPE.2018.18.2.558
- [J43] P. Magdy, **M. I. Marei**, and A. A. El-Sattar, "A Fault-Tolerant Strategy Based on SMC For Current-Controlled Converters," *International journal of electronics (Taylor & Francis)*, Vol. 105, No. 5, May 2018, pp. 817-835. DOI: 10.1080/00207217.2017.1409808
- [J44] M. Ibrahim, **M. I. Marei**, and A. A. El-Sattar, "A grid-connected PV system based on multilevel modular capacitor clamped dc-dc converter," *International Journal of Recent Trends in Engineering & Research (IJRTER)*, Vol. 4, No. 6, June 2018, pp. 151-161.
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- [4] Amr Mohamed Ibrahim, "Protection for Flexible Alternating-Current Transmission Systems," **Ph.D.**, Ain

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- [48] Mohamed AL-Emam Saeed Ragab, "Investigating the maximum power point tracking of PV arrays under partial shading conditions," **M.Sc.**, Ain Shams University, (July 2019)
- [49] Maha Shata, "Study of thermal and electrical performance of Photovoltaic cell using porous media for cooling," **M.Sc. (Mech. Dept.)**, Ain Shams University, (August 2019)
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- [52] Ahmed Haitham EL-Ebiary, "Optimized Controller for Converter Based DG," **M.Sc.**, Ain Shams University, (Jan 2020)
- [53] Walid Ali Mohamed Ahmed Hatahet, "Performance enhancing of grid-connected DC microgrids," **M.Sc.**, Ain Shams University, (August 2020)
- [54] Mariam Ahmed Sameh, "Optimum Control of PV System Under Partial Shading Conditions," **Ph.D.**, Ain Shams University, (Sept. 2020)
- [55] Fathy Hamed Hussein Awad, "A Control Technique for Grid-Connected PV System under Unbalanced Conditions," **Ph.D.**, Ain Shams University, (Jan. 2021)
- [56] Sayed Mohamed Sayed Mousa, "Control and Operation of a Hybrid Microgrid," **M.Sc.**, Ain Shams University, (Mar. 2021)
- [57] Mohamed Mostafa El-sotouhy, "A control Technique for Four Leg Inverter to Diminish Electrical Grid Unbalance," **Ph.D.**, Ain Shams University, (26 June 2021)
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- [59] Islam Alaa, "Energy Management of Electrical vehicles charging stations considering uncertainties," **M.Sc.**, Ain Shams University, (Oct. 2021)
- [60] Karim Mounir El-Sharawy, "Unified Control Strategy of Distributed Generation for Grid-Connected and Islanded Operation Conditions using an Artificial Neural," **M.Sc.**, Arab Academy for Science, Technology

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- [61] Merna Abbas, "Performance Enhancing of Wind Energy Conversion System," **M.Sc.**, Ain Shams University, (Jan. 2022)
- [62] Atef Mansour, "Seamless control for a photovoltaic system," **PhD.**, Ain Shams University, (Feb. 2022)
- [63] Omar Mohamed, "High Step-Down Ratio DC-DC converter for Water Desalination Systems," **M.Sc.**, Ain Shams University, (Aug. 2023)
- [64] Ahmed Haytham, "A Distributed Control Strategy for DC Microgrids," **PhD.**, Ain Shams University, (Nov. 2023)
- [65] Ahmed Zakaryah, "Power Converters Topologies for DC Collection Systems of Offshore Wind Farms," **PhD.**, Ain Shams University, (Dec. 2023)

External Examiner for :

- [1] Kotb Al-bassioni, "Performance improvement of Matrix Converter Connected to wind energy system," **M.Sc.**, Menoufia University, Faculty of Engineering, Department of Electrical Engineering, under supervision of Prof. Shokry Saad Shokrallah, Prof. Elwy Eissa El-Kholy, and Dr. Ahmed Fathi Abdou, Sept. 2016.
- [2] Jossian Messiha, "Analysis of concentrated photovoltaic (CPV) performance a distributed generator," **M.Sc.**, Ain Shams University, under supervision of Prof. Mohamed Abdel Latif Badr and Dr. Rania Abdel Wahed, (Jan. 2017).
- [3] Ahmed Hisham Abd El-Razek Abu El-Naga, "Primary and Secondary Control on Autonomous Microgrid Operation," **M.Sc.**, Ain Shams University, under supervision of Prof. Hamdy S.K. Elgohary and Dr. Amr Magdy Abdin, (Feb. 2017)
- [4] Ahmed Khamis Mohamed Hassan, "Power Quality Enhancement By Electric Springs," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Alexandria, under supervision of Prof. Ahmed A. Lotfy, Dr. Ahmed Kadry, and Dr. Nahla Ezz El-Din, (Feb. 2017)
- [5] Omar Mahmoud Ahmed, "Development of Battery Charge-Discharge Regulator for Photovoltaic System Supplied DC Lighting," **M.Sc.**, Mansoura university, Department of Electrical Power and Machines, under supervision of Prof. Saad Eskander, (Mar. 2017)
- [6] Mohamed Abdel-fatah Zaery, "Design of Distributed Control System for DC Microgrids Based Power Converters," **M.Sc.**, Aswan university, Department of Electrical Engineering, under supervision of Prof. Mohamed Orabi and Dr. Emad M. Ahmed, (17 May 2017).
- [7] Ahmed Moustafa Omran, "Interconnection between Different DC Technologies at Multi-Terminals High Voltage Direct Current Networks," **Ph.D.**, Alexandria university, Department of Electrical Engineering, under supervision of Prof. Ibrahim Fouad Alarabawy and Dr. Mostafa Saad Hamad, (25 May 2017).
- [8] Elsaid Farahaat, "High Performance Control of Multilevel Converter for Induction Generator with Variable Speed Wind Turbine," **Ph.D.**, Ain Shams University, under supervision of Prof. Ahmed Abdel-Sattar and Prof. Ahmed Attallah, (Sept. 2017).
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- [10] Mohamed Fawzy A.-Aal A.-Gwad, "An advanced maximum power point tracking control technique for a photovoltaic-solar pump system," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Cairo, under supervision of Assoc. Prof. Sameh Shabaan and Assoc. Prof. Mohamed I. Abu El-Sebah (Jan. 2018).
- [11] Mohamed Eladly, "Control of a switched reluctance generator for variable-speed wind energy applications," **Ph.D.**, Ain Shams University, under supervision of Prof. Ahmed Abdel-Sattar and Prof. Naggar Hassan (June 2018).
- [12] Islam Mohamed Soliman, "Post-fault speed sensor-less operation of a six-phase induction motors," **M.Sc.**, Ain Shams University, under supervision of Prof. Hussein Faried, Assoc. Prof. Ayman Samy Abdel-khalik, and Dr. El-Hussein Abbas Mahmoud (June 2018).
- [13] Ahmed Shabaan Ragab, "Grid connected photovoltaic system using resonant converter," **M.Sc.**, Ain Shams University, under supervision of Prof. Ahmed Abdel-Sattar and Prof. Naggar Hassan (July 2018).
- [14] Ahmed Zaghloul Hssein, "Reactive power and voltage control of offshore wind farm connected to the grid," **M.Sc.**, Ain Shams University, under supervision of Prof. Naggar Hassan and Prof. Said Fouad Mekhamer (April 2019).
- [15] Ahmed Hesein Mohamed, "BLDC motor speed control based-optimized Fuzzy PID algorithm," **M.Sc.**, Arab

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- [16] Nehmedo Hussein, "Resonant Micro-inverter for three-phase grid connected photovoltaic systems," **M.Sc.**, Aswan university, Department of Electrical Engineering, under supervision of Prof. Mohamed Orabi and Dr. Emad M. Ahmed, (April 2019).
- [17] Yahya Zakaryah, "Design and control of converters in AC/DC Hybrid Microgrid," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Alexandria, under supervision of Prof. Mostafa Saad and Assoc. Prof. Mostafa Abdel-Galil (June 2019).
- [18] Ayman Radwan, "Utilization of Energy Storage for Improving Power Quality of Smart Distribution Systems," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Cairo, under supervision of Prof. Rania El-sharkawy, Magdy Salama, and Mohamed Sadek (June 2019).
- [19] Ibrahim El-Sayed Ibrahim Saad, "Maximizing DG output power using Multilevel transformerless inverter," **M.Sc.**, Ain Shams University, under supervision of Prof. Naggar Hassan and Dr. Walid El-Khattam (June 2019).
- [20] Ayman Mahmoud Abde El Rahman Eisa, "Intelligent over-vibration production modeling and simulation," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Cairo, under supervision of Prof. Yasser Galal and Prof. Noha El-Amary (June 2019).
- [21] Amr Mohamed Saleh, "Grid connected photovoltaic using multi level inverter," **M.Sc.**, Ain Shams University, under supervision of Prof. Ahmed Abdel Satter and Prof. Naggar Hassan (August 2019).
- [22] Hussein Mohamed Othman Tawfik Waly, "Maximum Power Point Tracking for Three Phase Induction Motor Fed from Photovoltaic System," **Ph.D.**, Menoufia University, under supervision of Prof. Awad E. El-Sabbe, Ass. Prof. Haitham Z. Azazi, and Dr. Dina S.M. Osheba (Sept. 2019).
- [23] Abdelrahman Ismail, "Local AC network support via HVDC tapping station," **M.Sc.**, Alexandria university, Department of Electrical Engineering, under supervision of Prof. Emtethal Negm Abdallah, Prof. Mostafa Saad Hamad, and Assoc. Prof. Amr El-Zawawi (Oct. 2019).
- [24] Ahmed Ismail Saad Ibrahim, "Combined power supply system and attitude control system for satellites," **M.Sc.**, Ain Shams University, under supervision of Prof. Naggar Hassan and Dr. Mohamed Ezzat (April 2020).
- [25] Mohamed Mustafa Badr Mustafa Ismail, "Detection and Diagnosis for the Photovoltaic Array Faults Based on the Support Vector Machine," **M.Sc.**, Alexandria university, Department of Electrical Engineering, under supervision of Prof. Ragi Ali Rafaat Hamdy, Prof. Ayman Samy Abdel-Khalik, Prof. Mostafa Saad Hamad, and Prof. Ibrahim Fouad Abdelrahman Elarabawy (June 2020).
- [26] Latefa Ahmed El-Sharaway, "Enhanced Grey Wolf Optimization for GMPP Tracking of PV Systems Under Partial Shading Condition," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Cairo, under supervision of Prof. Hadi M. El Helw, and Hany M. Hasanien (Aug. 2020).
- [27] Ahmed Hossam El-Din, "Maximum Power Point Tracking Under Partial Shading Condition using Particle Swarm Optimization with DC-DC Boost Converter," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Cairo, under supervision of Prof. Hadi M. El Helw, and Said Fouad (Oct. 2020).
- [28] Mohamed Ahmed A.M. Aboushal, "Advanced Decentralized Control Strategies for Inverter-based Micro-Grids," **Ph.D.**, Alexandria university, Department of Electrical Engineering, under supervision of Prof. Ibraim El-Arabawy, Prof. Mahmoud Ahmed Tawfik El-Gamal, and Assoc. Prof. Mohamed Mohamed Zakaria Mostafa (8 Dec. 2020).
- [29] Mohamed Hamdy Abdel Rahman, "Optimum solution to power quality problems caused by connecting renewable energy resources to power system," **M.Sc.**, Ain Shams University, under supervision of Prof. Al Moataz Youssef and Dr. Mahmoud Abd Allah (16 Dec. 2020).
- [30] Mostafa Reda Mostafa Abd El-Aziz, "Maximum Power Point Tracking of a Photovoltaic system using sliding mode control," **M.Sc.**, Ain Shams University, under supervision of Prof. Ahmed Abdel-Sattar and Prof. Naggar Hassan (23 Dec. 2020).
- [31] Abdulkarim Nasir, "A Fast Charging Station for Electric Vehicles with Constant Current-Constant Voltage Control Technique," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Alexandria, under supervision of Prof. Mostafa Saad and Dr. Ahmed K. ElShenawy (18 Nov. 2021).
- [32] Mohamed El-Gohary Hassan, "Advanced Control of Induction Motor Fed by Photovoltaic System," **M.Sc.**, Mansoura university, Department of Electrical Power and Machines, under supervision of Prof. Saad Eskander and Eid Abdel Baki Gouda, (7 Dec. 2021)
- [33] Mahmoud Samy El-sayed El-sayed, "Investigation of Induction Motor Drive using Reduced Switch Multilevel Inverter," **M.Sc.**, Ain Shams University, under supervision of Prof. Ahmed Abdel-Sattar (passed

- away), Prof. Naggar Hassan, and Dr. Mohamed Mokhtar (15 Dec. 2021).
- [34] Mohamed Osamma Mahmoud, "Mitigation of harmonics of renewable energy systems by using active power filter technique," **Ph.D.**, Ain Shams University, under supervision of Prof. Hamdy Elgohary, Prof. El-syed Abdel-Aleem (passed away) and Dr. Wael Mamdouh. (12 Jan. 2022).
- [35] Ahmed Mohamed Hamed Shokran, "Effect of Blade Pitch Angle Control on Wind Turbine Power Generation," **Ph.D.**, Ain Shams University, under supervision of Prof. Abdullah El-Marhomy and Ass. Prof. Mahmoud Abdallah Attia. (6 April 2022).
- [36] Ahmed Mohamed Khalid, "A Novel Technique for Rotor Side Converter Protection in Doubly Fed Induction Generators," **Ph.D.**, Ain Shams University, under supervision of Prof. Almoataz Yousef, Prof. Hady El-Helw and Ass. Prof. Mohamed Ezzat. (24 May 2022).
- [37] Mahmoud Abdulsalam Alshahat, "Modeling and control of modular Multilevel Converters with energy storage systems for photovoltaic applications," **M.Sc.**, Tanta University, under supervision of Prof. Essam Eddin M. Rashad and Dr. Sherif Mousa Dabour (25 June. 2022).
- [38] Sahar Abd-elmoniem Nasef, "Analysis and modeling of hybrid wind-photovoltaic energy system based on intelligent control techniques," **Ph.D.**, Ain Shams University, under supervision of Prof. Almoataz Yousef, Prof. Mohamed B. Zahran (National Authority for Remote Sensing & Space Sciences), Prof. Mohamed K. Ahmed El-Shaer (Al-Azhar uni.), and Dr. Amal Abdel-Aal Hassan Mohamed (ERI). (24 May 2022).
- [39] Ahmed Alaa Aziz Ezzat Mahmoud Khedr, "Sequential Switched Capacitors start-up method for the single-phase modular multilevel converter," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Alexandria, under supervision of Prof. Walid Ahmed Maher (16 Nov. 2022).
- [40] Yousef Ahmed Elthokaby, "Model Predictive Control of Split-Source Inverter for Photovoltaic Systems," **Ph.D.**, Ain Shams University, **Ph.D.**, Benha University (Shobra), under supervision of Prof. Naser Abdel-Rahim, Dr. Ibrahim Abdelsalam, Islam Mohamed Abdealqawee (19 Nov. 2022).
- [41] Fawzy Adel Fawzy Abdo, "Design and Performance Analysis of Direct AC-AC converter," **M.Sc.**, Menoufia University, under supervision of Prof. Azza M.E. Lashine, Prof. Awad E.A. El-Sabbe, Ass. Prof. Dina S.M. Osheba (Feb. 2023).
- [42] Ahmed R. El-Mallawany, "A Novel Fault Detection System for HAWT Pitch and Yaw Control Mechanism Based on Neural Networking," **Ph.D.**, Helwan University (El-Mataryah), under supervision of Prof. Ayda Abdel Hafiz and Prof. Dr. Sameh Shabaan (15 Feb. 2023).
- [43] Amira Khaled Elkodama, "Investigation of a Yaw Control System for a Co-planar Twin-rotor Wind Turbine," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Cairo, under supervision of Prof. Sameh Shabaan, and Dr. Ahmed Abdellatif Hamed (20 Mar. 2023).
- [44] Ahmed Elkassar, "Smart Electrical Meter using Internet of Things," **M.Sc.**, Arab Academy for Science, Technology & Maritime Transport, Alexandria, under supervision of Prof. Ahmed Abou Elfarag, Prof. Walid Ghoniem, and Dr. Eman Hamdan (3 Sept. 2023).
- [45] Alaa Omar, "Modular Multilevel Converters for Electric Vehicle Applications," **Ph.D.**, Deptment of Electrical and Electronic Engineering, University of Canterbury, **Christchurch New Zealand**, under supervision of Prof. Paul GAYNOR, Prof. Alan Wood, and Dr. Hamish Laird (10 Sept. 2023).
- [46] Abdelwahab Khalifa, "Maximum Power Tracking of Photovoltaic Systems Using Artificial Intelligence Algorithms," **M.Sc.**, Port Said University, under supervision of Prof. Ahmed Kalas, Dr. Medhat Elfar, and Dr. Ahmed Refaat Abouelfadl (16 Sept. 2023).
- [47] Mahmoud Aly Mahmoud Khamis, "Robust Model Predictive Control of Permanent Magnet Synchronous Machine Drive Systems," **M.Sc.**, Tanta University, under supervision of Prof. Essam Eddin M. Rashad, Prof. Abdelsalam Ahmed Abdelsalam, and Dr. Ahmed M. El-Refaie Omara (15 Nov. 2023).

NON-REFEREED TECHNICAL REPORTS

- [R1] DC/DC Converters for Fuel Cell Powered Hybrid Electric Vehicle, May 2004, invited presentation to Hydrogenics corporation, Mississauga, Ontario, Canada.
- [R2] Design of a DC chopper Controller for an Eddy Current Absorber, Aug. 2004, submitted to **Electric vehicle research group, Electrical and Mechanical Engineering Depts.**, University of Waterloo, Ontario, Canada.
- [R3] Vector Control Of Induction Motor For the Electric Vehicle, April 2003, submitted to **Electric vehicle research group, Electrical and Mechanical Engineering Depts.**, University of Waterloo, Ontario, Canada.
- [R4] Voltage Unbalance Definitions and Standards, May 2003, submitted to **KFPUM, Saudi Arabia**. (This proposal has been prepared in response to a request from the Research Institute of King Fahd University of Petroleum & Minerals to conduct a study on the voltage unbalance causes, effects and mitigation techniques).

- [R5] Power Quality Mitigation Equipment (Task #3 for a project titled “*Power Quality Monitoring and Standards*”), July 2003, submitted to **KFUPM, Saudi Arabia**.
- [R6] The Science and Technology Development Fund (STDF) Project ID: 1496
Project Title: Connection Of Power From Wind Energy to National Grid.
Four reports are submitted during the period Dec. 2010 to Mar. 2013.

R&D Projects

1. “A Modular interleaved Electric-Vehicle battery charger”. This is a joint-research project with College of Technological Studies – PAAET, Kuwait, funded by Kuwait Foundation for the Advancement of Sciences (KFAS). 2022/2023.
2. “A smart electric-vehicle battery charging system”. (TS-21-09). This is a joint-research project with College of Technological Studies – PAAET, Kuwait, funded by Kuwait Foundation for the Advancement of Sciences (KFAS). 2021/2022.
3. “Integrated BESS and PV interface system for power smoothing and voltage regulation”. (TS-19-11). This is a joint-research project with College of Technological Studies – PAAET, Kuwait, funded by Kuwait Foundation for the Advancement of Sciences (KFAS). 2019/2020.
4. “A Modular Multi-Terminals PV Interfacing System”. (PN17-15EE-01). This is one year joint-research project with College of Technological Studies – PAAET, Kuwait, funded by Kuwait Foundation for the Advancement of Sciences (KFAS). 2018/2019.
5. “Connection of Power From Wind Energy to National Grid”. This is a two years research project, funded by Science and Technology Development Fund (STDF) – Egypt. Oct. 2010 - 2013.
6. “Development of an Energy management unit for Hybrid Electric Vehicles using Ultracapacitors for regenerative braking” For NSERC, Canada – 2004 to 2006. The aim of this project is to investigate the most efficient and economic use of the energy resources available for the hybrid vehicles to maximize the efficiency of the IC engine, reduce the fuel consumption and hence the emission. Ultracapacitor unit is used to store the braking energy and then utilize it back for accelerating the vehicle using the electric motor. This management unit is responsible for coordinating the operation of both the electric motor and the IC engine utilizing different energy sources such as batteries, ultracapacitor and fuel.
7. “*Design of a medium voltage (MV) single phase inverter for the insulation testing of electric motor drives*” For the high voltage research group at university of Waterloo, 2005. I designed and developed a MV inverter that can generate PWM signals to mimic the switching pulses of the MV drive systems. This system is utilized to test the insulation failure in high power AC drives that works at 6.6 KV with power inverters. This project is funded from General Electric Company through University of Waterloo.
8. “Development of an eddy current absorber controller” For Cycle Improvement Ltd., Canada – 2004. The eddy current absorber is utilized for testing the dynamic behavior of any engine under different loading conditions. I developed an efficient 20 KW buck DC/DC power electronic converter for regulating the absorber loading for the company mentioned above. The control system is based on a PIC micro-controller (16F73), one of the cheapest microcontroller in the world.
9. “*Power Quality Monitoring and Standards*” For KFUPM University – Saudi Arabia, 2003. This proposal has been prepared in response to a request from the Research Institute of King Fahd University of Petroleum & Minerals to conduct a study on the different power quality standards, equipment and mitigation devices.
10. “*Design and implementation of a scaled down experimental prototype model for an electric vehicle*” For Auto21 team at university of Waterloo, Canada - 2003. I developed a digital controller for a 2KW three phase induction motor using DSP (TMS320LF2407A) system. The inverter’s switches and their driving circuits are implemented on the same board. The energy source was a battery pack rated at 36 volt. I developed a boost DC/DC converter to generate a 300 volt from the batteries at the motor controller terminals. The electronic system is

designed using the highest technologies to mimic the behavior of electric vehicles in roads.

11. “*Design of the electricity system in El-Tebeen water plant*” For Ministry of Public Works and Water Resources, Egypt –2000. The aim of this project is to upgrade the electrical system in the water planet. The electrical specification of the equipment such as pumps, motors, contactors, relays,... etc are designed based on calculating the loads for the water plant. The wiring diagram is revised and modified to fulfill the required demand of the plant.
12. “*Development of stepper motor controller*” For Cleopatra ceramic, Egypt - 1999. The objective of this project was to design power electronic converters for two stepper motors used for controlling 2D movements of a robot. This robot is a main unit in one of the production lines at Cleopatra ceramic factory. Its function is to paint and glaze ceramics. I designed and developed the control algorithm for the Intel (80C51) microcontroller that is used to control the operation of the power converters.

TEACHING EXPERIENCE

Over 25 years of solid practical experience in teaching as teaching assistant and lecturer in both Canada and Egypt. Courses taught have varied from basic to advance courses.

1. University of Waterloo, Ontario, CANADA (UW)

I have taught 8 tasks as a teaching assistance during my course of study towards my Ph.D. Courses ranged from fundamental core courses like *ECE100* and *ECE126* to more specialized courses like *ME269* and *ECE261* and post graduate courses such as *ECE-PD-03*. In all of these courses, I have granted top evaluation in all aspects. Teaching of *ECE 100* and *ECE 126* are done through an interactive computer network (CDT).

COURSE	TERM	LEVEL
Electromagnetic Compatibility and Power Quality (<i>ECE-PD-03</i>)	Spring 2004	Graduate studies program (Ontario Hydro).
Energy Systems (<i>ECE261</i>)	Fall 2002	2 nd year, ELEC.
Electromechanical Devices and Power Processing (<i>ME269</i>)	Fall 2001 & Winter 2004	2 nd year, MEC.
Electricity and Magnetism (<i>ECE 126</i>)	Winter 2002 and Winter 2003	1 st year
Fundamentals of Electrical Engineering (<i>ECE100</i>)	Summer 2002 and Summer 2003	1 st year ELEC.

2. Ain Shams University, Cairo, Egypt

I have taught many courses ranging from fundamental course for circuits, electromagnetism and electric machines and ended up with more specialized courses on power electronics, electric drives, microprocessor and digital control. I designed many lab experiments for power electronic, electric circuits, electrical measurement, electrical machines, and power systems.

- **Undergraduate Program:**

- Electric drives (*EPM 483*), (*EPM 451s*), (*EPM 455*).
- Advanced control in power systems (*EPM 482*)
- Power electronics 2 (*EPM 451/ EPM 352s*)
- Power electronics 1 (*EPM 351*)
- Electrical testing: 200, 300, and 400 levels.
- “*Digital control systems*” 400 level. (Tutorials only)
- “*Microprocessor applications*” 400 level. (Tutorials only)
- “*Energy conversion devices*” 200 level. (Tutorials only)
- “*Electrical machines*” 200 level. (Tutorials only)
- “*Electric circuit analysis*” 100 level. (Tutorials only)
- “*Theory of electromagnetics*” 100 level. (Tutorials only)

- Diploma, MsC and PhD Programs:
 - Power Electronics Systems (EPM 641)
 - Power Generation from Renewable Sources (EPM 651)
 - Renewable Energy Technologies (EPM 556)
 - Wind Energy Conversion Systems (EPM 562)
- *Currently, I am co-supervising 6 Master students and 3 PhD candidates (2 of them in writing phase).*

3. Credit Hours Programs, Ain Shams University (Energy and Renewable Energy Program)

- Microprocessor based automated systems (ERGY 451/EPM 336).
- Power electronics 1 (ERGY 450/ EPM 353/ EPM 251)
- Power electronics 2 (ERGY 451/ EPM 354)
- Power electronics and drives (EPM 282)
- Industrial Electronics (EPM 151)
- Electric Drives (ERGY 553)
- Power Quality (ERGY 453 / EPM 337 / EPM 456)

4. Arab Academy for science & technology & maritime transport (Cairo branch)

- Undergraduate Program:
 - Electrical drives I (EE424)
 - Electrical drives II (EE522)
 - Power electronics I (EE421/ EE323)
 - Power electronics II (EE423)
 - Microprocessor based process control systems (EE413)
 - Microcontroller applications (EE416)
 - Electrical Engineering Fundamentals (EE238)
- MsC Program:
 - Electrical measurement systems (EE705)
 - Advanced Power Electronics (EE725)
 - Advanced Electrical Drives (EE724)
 - Electric Vehicles Integration into Smart Grid (SMT 722)

5. French University in Egypt (UFE) 2007/2008

- Electrical power engineering.

6. British University in Egypt (BUE) 2008/2010

- Control system design (ENGG01I02).
- Digital Control (ELEC08I01).
- Measurement and instrumentation (ENGG06H02)

7. Short courses

a. I Developed a technical course titled: “**Distributed generation technology**” for CYME T&D International research institute. I delivered this course on Montreal at June 2005. The course covered the DG technologies and standards, key issues of DG, interfacing and operation.

b. I delivered a technical course titled: “**AC/DC Converters**” for the Engineering Consulting Center (ECC), Electrical Power and Machine Department, Faculty of Engineering, Ain Shams university, June 2007.

c. I prepared the following courses for Saudi Electricity Company (SEC):

- 1- Instrumentation in Control Systems.
- 2- Effective applications of power electronics.

- 3- Modern Power System Protection: Application and performance analysis.
- 4- Power quality and Harmonics.
- 5- Electrical power substation maintenance.
- 6- Coordination of electric power distribution systems.
- 7- Substation equipment and control systems.
- 8- SCADA and telemetry.
- 9- Automatic Voltage Regulator.
- 10- Application of Power Capacitors in the Operation of Electrical Equipment and Systems.
- 11- Digital techniques in power line carrier.

d. I prepared the following course for Saudi SABIC through GTC.
- Basic instrumentation and Control systems: Al-Jubail, May 2011.

e. Power Systems Computer Aided Design (PSCAD), Credit hours program, 9 sessions/ 3 weeks, Summer 2021.

8. Graduation projects

- 1- Railway safety and automation, Ain Shams University, 2006/2007.
- 2- Single phase Inverter, Ain Shams University, 2006/2007.
- 3- Integrated analysis, control, and protection of electrical drives in large industrial plants, Arab Academy for Science & Technology, September 2006 / July 2007.
- 4- A data logger for power quality monitoring, Arab Academy for Science & Technology, Feb. 2007 / Feb. 2008.
- 5- A Solid-state transformer microcontroller based, Ain Shams University, 2007/2008.
- 6- Advanced SCADA and PLC automation system, Ain Shams University, 2007/2008.
- 7- A microcontroller based induction motor drive, Arab Academy for Science & Technology, September 2007 / July 2008.
- 8- Wind energy simulator, Arab Academy for Science & Technology, Feb. 2008/Feb. 2009.
- 9- Single phase PWM AC chopper, Ain Shams University, 2009/2010.
- 10- Matrix Converters, Ain Shams University, 2009/2010.
- 11- PV generation system, Arab Academy for Science & Technology, 2009/2010.
- 12- An Advanced DC Chopper, Ain Shams University, 2010/2011.
- 13- PV generation system based on Multilevel Inverters, Arab Academy for Science & Technology, 2010/2011.
- 14- Wave Energy Simulator, Ain Shams University, 2011/2012.
- 15- Educational setup for power electronics converters, Ain Shams University, 2011/2012.
- 16- A PWM inverter for interfacing renewable and storage energy systems, Arab Academy for Science & Technology, 2011/2012.
- 17- Uninterruptible power supply (UPS), Ain Shams University, 2012/2013.
- 18- Uninterruptible power supply (UPS), Arab Academy for Science & Technology, 2012/2013.
- 19- Uninterruptible power supply (UPS), Arab Academy for Science & Technology, 2014/2015.
- 20- Microcontroller based Power Electronics DC Transformer, Ain Shams University, 2015/2016.
- 21- A microcontroller based induction motor drive system, Arab Academy for Science & Technology, 2015/2016.
- 22- A microcontroller based induction motor drive system, Arab Academy for Science & Technology, Feb. 2016 / Feb. 2017.
- 23- Advanced power electronics systems, Ain Shams University, 2016/2017.
- 24- Neutral Point Clamped Inverter for Medium Voltage Applications, Arab Academy for Science & Technology, 2016/2017.
- 25- A grid-connected PV system, Arab Academy for Science & Technology, 2016/2017.
- 26- A High Performance Uninterruptible Power Supply, Arab Academy for Science & Technology, Feb. 2017/ Feb. 2018.
- 27- Electrical Vehicle, Arab Academy for Science & Technology, 2017/2018.
- 28- Smart Modular Battery Charger, Arab Academy for Science & Technology, 2017/2018.
- 29- A PV system for isolated load applications, Arab Academy for Science & Technology, Feb. 2018.

- 30- A high power electrical drivetrain system for heavy industrial applications and large size electric vehicles, Arab Academy for Science & Technology, 2018/2019.
- 31- Mind controlled prosthetic limb, Arab Academy for Science & Technology, 2018/2019
- 32- A smart electric vehicle charging station, Arab Academy for Science & Technology, 2019/2020
- 33- A solar photovoltaic water pumping system technology for irrigation and community drinking water supplies, Arab Academy for Science & Technology, 2019/2020.
- 34- Three-phase inverter for motor control and grid connection, CHEP, Ain Shams University, 2019/2020.
- 35- A PV based water pumping system for irrigation, Arab Academy for Science & Technology, 2020/2021
- 36- Multi tank filling automation and HMI, Arab Academy for Science & Technology, 2020/2021
- 37- A smart Battery charger for Electric Vehicles, Ain Shams University, 2020/2021.
- 38- A universal electric-vehicle Battery charger, CHEP, Ain Shams University, 2020/2021
- 39- A prototype for wind energy conversion system, Ain Shams University, 2021/2022
- 40- Energy Management for a Microgrid with renewable systems, CHEP, Ain Shams University, 2021/2022
- 41- Study of a Microgrid including PV and small scale wind turbines, CHEP, Ain Shams University, 2021/2022.
- 42- Onboard Battery Charger for Electric Vehicles, Ain Shams University, 2022/2023
- 43- Current and Voltage Controllers for Battery Charging Systems, CHEP, Ain Shams University, 2022/2023.
- 44- Non Inverting Buck-Boost Converter based PV System, CHEP, Ain Shams University, 2022/2023.

TRAINING WORKSHOPS

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|-----------------|--|
| June 2021 | • Developing the competencies of university department heads, Two days workshop, Ain Shams University, Cairo, Egypt. |
| Jan. 2016 | • Scientific Conference Organization, Two days workshop, Ain Shams University, Cairo, Egypt. |
| Jan. 2014 | • Ethics of Scientific Research, Three days workshop, Ain Shams University, Cairo, Egypt. |
| Dec. 2013 | • Examination systems and students evaluation, Three days workshop, Ain Shams University, Cairo, Egypt. |
| Oct. 2013 | • The international publications, Three days workshop, Ain Shams University, Cairo, Egypt. |
| Oct. 2012 | • Quality standards for educational process, Three days workshop, Ain Shams University, Cairo, Egypt. |
| Dec. 2011 | • Management of a research team, Three days workshop, Ain Shams University, Cairo, Egypt. |
| 28-31 June 2011 | • Integration of renewable energies in national and regional energy matrixes – Advancement of curricula. Amman, Jordan. Conducted and financially supported by the German International Cooperation (GIZ). |
| Jan. 2009 | • The financial and legislation issues, Three days workshop, Ain Shams University, Cairo, Egypt |
| Aug. 2008 | • The research and competitive projects, Three days workshop, Ain Shams University, Cairo, Egypt |
| Mar. 2008 | • The effective presentation, Three days workshop, Ain Shams University, Cairo, Egypt |
| Feb. 2008 | • The scientific research, Three days workshop, Ain Shams University, Cairo, Egypt |
| Mar. 2007 | • The credit hours system, Three days workshop, Ain Shams University, Cairo, Egypt |
| Mar. 2007 | • Using technology in teaching, Three days workshop, Ain Shams University, Cairo, Egypt |
| Sept. 2001 | • Teaching on University, Three days workshop, University of Waterloo, Waterloo, Ontario, Canada. |
| July 2000 | • Preparing University Instructor Workshop, Three weeks workshop, Ain Shams University, Cairo, Egypt. |
| Jan 1997 | • Operation and control of hydro power stations, Five days workshop, Ministry of Electricity and Power, Cairo, Egypt. |
| July 1996 | • Operation and control of thermal power stations, Two months workshop, Shobra El-Khyma power station, Cairo, Egypt. |