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Personal Data

Name: Mohammad Saleh Mahmoud Widyan.

Date & Place of Birth: December 5th 1976, Irbid, Jordan.

Nationality: Jordanian.

Marital Status: Married with Two Children.

Contact Information

Mohammad S. Widyan, Ph.D

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Academic Qualifications

- 1) Ph.D. in Electrical Engineering, “**Electrical Machines**”, Thesis entitled as “Design, Optimization, Construction and Test of Rare-Earth Permanent-Magnet Electrical Machines with New Topology for Wind Energy Applications”, Institute of Energy and Automation Technology, Berlin University of Technology (Germany), 2006, Grade: **Excellent**.
- 2) M.Sc. in Electrical Engineering, “**Electrical Power & Control Engineering**”, Thesis entitled as “Applying Bifurcation Theory on the IEEE Second Benchmark Model of Subsynchronous Resonance”, Jordan University of Science and Technology (JUST), 2002. **GPA= 88.1 out of 100**, Grade: **Excellent**.
- 3) B.Sc. in Electrical Engineering, “**Electrical Power Engineering**”, Yarmouk University, 2000. **GPA= 78.6 out of 100**, Grade: **Very Good**.

Work Experience

- 1) Professor in Electrical Engineering Dept. at The Hashemite University from September 5th 2017 till now.
- 2) Associate Professor in Electrical Engineering Department at The Hashemite University from February 16th 2012 till September 4th 2017..
- 3) Associate Professor in Electrical Engineering Department at Princess Sumaya University for Technology (PSUT) for the Academic Year 2013/2014 (Sabbatical Leave).
- 4) Assistant Professor in Electrical Engineering Department at The Hashemite University from September 10th, 2006 till February 15th, 2012.
- 5) Lecturer in Electrical and Computer Engineering Department at The Hashemite University from September 2002 up to September 2003 teaching Electrical Circuits and Electrical Machines Courses.
- 6) T.A. in Electrical Engineering Department at Jordan University of Science and Technology (JUST), during the Master Studies teaching Electrical Machine and Circuit Laboratories starting from June 2000 up to May 2002 .

Awards:

- 1) The **Second** among the 27 Bachelor Students graduated in the same academic year.
- 2) The **Second** among the 10 Master Students graduated in the same academic year.
- 3) **Scholarship** from **The Hashemite University** for Ph.D. studies for three years to Berlin University of Technology.
- 4) **Thanking Letters** from the **President of The Hashemite University** for teaching performance.
- 5) **Honoring From His Royal Highness Prince El Hassan bin Talal** For a Speech at "The National Campaign on Public Awareness For the Drivers of Change Workshop", The 15th Jordan Science Week, "**Science and Technology: Drivers of Change**", Royal Scientific Society: Princess Sumaya University for Technology (PSUT), May 10-12, 2010.
- 6) **First Rank Award** for Supervision the Graduation Project "Ocean Wave Powered High-Energy Rare-Earth NdFeB Permanent-Magnet Electrical Generator" in the 6th National Technology Parade (NTP), Mu'tah University 2013.

Research Fields of Interest

- 1) Conventional and Permanent-Magnet Electrical Machines Design.
- 2) Finite Element Technique.
- 3) Bifurcation Theory, Nonlinear Dynamics and Control.
- 4) Subsynchronous Resonance in Power Systems (Analysis & Control).
- 5) Power System and Electrical Machine Dynamics.
- 6) Renewable and Hybrid Energy Systems (Wind and Photovoltaic)
- 7) Dynamical Analysis of Various PV-Powered and Hybrid Electrical Systems.
- 8) Dynamical Analysis of Battery-Powered Electrical Machines.

Courses Taught

Undergraduate Courses:

- 1) Electrical Circuits I at The Hashemite University and Princess Sumaya University for Technology.
- 2) Electrical Circuits II at The Hashemite University, German Jordanian University and Princess Sumaya University for Technology.
- 3) Introduction to Electrical and Electronic Circuits at The Hashemite University.
- 4) Electrical Circuits for Computer Engineering Students at The Hashemite University.
- 5) Electrical Machines I at The Hashemite University, German Jordanian University and Princess Sumaya University for Technology.
- 6) Electrical Machines II at The Hashemite University and Al-Balqa Applied University.
- 7) Power Electronics at The Hashemite University, German Jordanian University, Yarmouk University and Princess Sumaya University for Technology.
- 8) Power System Stability at The Hashemite University.
- 9) Electric Power System at The Hashemite University.
- 10) Power System Protection at The Hashemite University.
- 11) Special Topics in Electrical Engineering "Design of Electrical Machines" at The Hashemite University.
- 12) Design in Electrical Engineering "Design of Electrical Machines" at The Hashemite University.
- 13) Ethics and Communication Skills at The Hashemite University.
- 14) Renewable Energy Generation at The Hashemite University.
- 15) Fundamentals of Electrical Circuits for Non-Electrical Engineering Students at The Hashemite University.

Graduate Courses:

- 1) Advanced Power System Analysis, Graduate Course at Jordan University of Science and Technology (JUST).
- 2) Micro-Electro-Mechanical Systems (MEMS), Graduate Course at Yarmouk University.
- 3) Stability of Power Systems, Graduate Course at Yarmouk University.

Laboratories Taught

- 1) Electrical Machines I Lab.
- 2) Electrical Circuits I Lab.
- 3) Electrical Circuits II Lab.
- 4) Measurements and Control Lab.
- 5) Electronic Circuits I Lab.
- 6) Introduction to Electronic Circuits Lab.
- 7) Power Electronics Lab. at German Jordanian University.

Reference Peoples

- 1) Prof. Dr.-Ing. habil. Rolf E. Hanitsch, Ph.D. Supervisor.
Institute of Energy and Automation Technology, Berlin University of Technology,
rolf.hanitsch@iee.tu-berlin.de
- 2) Prof. Ahmad M. Harb, M.Sc. Supervisor.
Professor of Electrical Engineering, Jordan University of Science and Technology,. Currently,
German Jordanian University, ahmadharb@jgu.edu.jo.

Professional Activities

- 1) Chairman of Electrical Engineering Dept. at The Hashemite University for the Academic Year 2018/2019.
- 2) Dean Assistant for Basic Engineering Sciences Affairs/Faculty of Engineering for the Academic Year 2012/2013, (Newly Established Position).
- 3) Member in a Consultation Committee for Constructing Photovoltaic Farms (Renewable Energy Projects in terms of MW) for Investment of the Jordanian Armed Forces in Energy.
- 4) Member in a Consultation Committee for the Electrical Engineering Part of the Constructional Design for Two New Buildings for The Hashemite University (Class Session Complexes) during the Academic Year 2012/2013.
- 5) Member in a Consultation Committee for the Electrical Engineering Part of the Constructional Design for a New Building for the Arab Mining Company (Company and Institution Building).
- 6) Member in The International Program Committee of 9th International Renewable Energy Congress (IREC 2018).
- 7) Member at the IEEE (Institute of Electrical and Electronic Engineers).
- 8) Counselor for the IEEE Student Branch at The Hashemite University for the Academic Years of 2011/2012 and 2012/2013.
- 9) Member in the Editorial Board of the "International Journal of Power and Renewable Energy Systems" (IJPRES).
- 7) Member at the International Program Committee of the "Modern Nonlinear Theory" (MNT), IASTED International Conference.
- 8) Reviewer at "Electric Power Components and Systems Journal".
- 9) Reviewer at "International Journal of Electrical Power and Energy Systems".
- 10) Reviewer at the "International Journal of Modelling and Simulation".
- 11) Reviewer at the "International Journal of Power and Energy Systems".
- 12) Reviewer at "Jordan Journal of Mechanical and Industrial Engineering".
- 13) Reviewer at "European Transactions on Electrical Power" Journal.
- 14) Reviewer at "IET Generation, Transmission and Distribution" Journal.
- 15) Reviewer at "International Journal of Modern Nonlinear Theory and Application" Journal.
- 16) Reviewer at "Jordan Journal of Electrical Engineering".
- 17) Reviewer at Several International Conferences of Electrical Machines, Power Systems and Renewable Energy Systems.
- 18) Member at the "Jordan Engineering Association", JEA.
- 19) Member at "Vereinigung Jordanischer Absolventen Deutscher Universitaeten".
- 20) Member at the Scientific Committee of the "International Conference and Exhibition on Green Energy and Sustainability for Arid Regions & Mediterranean Countries", ICEGES 2009.
- 21) Chairman of the "Wind Energy" Session at "International Conference and Exhibition on Green Energy and Sustainability for Arid Regions & Mediterranean Countries", ICEGES 2009.
- 22) Electrical Engineering Department Representative at the Faculty Council Meeting for the Academic Years 2009/2010 and 2011/2012 at The Hashemite University.
- 23) Co-advisor for the following M.Sc. Theses:
 - a) Eng. Osama Al-Rahamneh, "Controlling Subsynchronous Resonance in Power System Using TCSC and SSSC: A Comparative Study", Electrical Engineering Dept., Jordan University of Science and Technology, 2010.
 - b) Eng. Tha'er Sweidan, "Operating Point Stability of Grid-Connected Photovoltaic Generator with Maximum Power Point Tracking using Perturbation and Observation Technique", Electrical Power Engineering Dept., Yarmouk University, 2015.

- c) Eng. Mohammad Abu Ashour, "Operational Performance of a Hybrid Powered Stand-Alone Wind-Powered Induction and Photovoltaic Generators Feeding Three-Phase Induction Motor for Pumping Applications", Electrical Power Engineering Dept., Yarmouk University, 2016.
 - d) Eng. Manar Qudah, "Performance Analysis of Different Series Compensation Schemes of SMIB Power System Incorporating PV Generator", Electrical Engineering Dept., Princess Sumaya University for Technology, 2019.
- 24) Head and Member at Several Administrative Committees at the Department and Faculty.
 - 25) External Examiner for Several M.Sc Theses Examining Committees at Jordan University of Science and Technology, Yarmouk University, Princess Sumaya University for Technology and German Jordanian University.
 - 26) Member at the Organizing Committee of the "8th Jordanian International Electrical and Electronic Engineering Conference" (JIEEEEC 2013) organized by the Jordan Engineering Association.
 - 27) Publication Chair for the "8th Jordanian International Electrical and Electronic Engineering Conference" (JIEEEEC 2013) organized by the Jordan Engineering Association.
 - 28) Editorial Board Member of the "International Journal of Power and Renewable Energy Systems" (IJPRES), American Society of Science and Engineering.
 - 29) Member in the International Program Committee of the "International Renewable Energy Congress" (IREC).
 - 30) Member in the Technical Program Committee of the "9th Jordan International Electrical and Electronics Engineering Conference" (JIEEE 2015) Organized by the Jordan Engineering Association.
 - 31) Member in the Steering Committee of the "8th International Renewable Energy Congress" (IREC 2017), German Jordanian University, March, 2017.
 - 32) Reviewer for Different Promotion files from neighboring countries.

Publications

Journal Papers

- 1) A. M. Harb & **M. S. Widyan**, "Chaos and Bifurcation Control of SSR in the IEEE Second Benchmark Model", Chaos, Solitons & Fractals Journal, Vol. 21, pp. 537-552, 2004, (Elsevier).
- 2) A. M. Harb & **M. S. Widyan**, "Controlling Chaos and Bifurcations of Subsynchronous Resonance in Power System", Nonlinear Analysis: Modelling and Control, Vol. 7. No. 2, pp.15-36, 2002, (Vilnius University).
- 3) **M. S. Widyan** & R. E. Hanitsch, "A Three-Phase Sinusoidal Novel Permanent-Magnet Synchronous Generator", International Journal of Power and Energy Systems, Vol. 29, No. 1, pp. 57-64, 2009, (Actapress).
- 4) **M. S. Widyan** & A. M. Harb, "On the Effect of TCSC and TCSC-Controller Gain on Bifurcations of Subsynchronous Resonance in Power Systems", International Journal of Modelling and Simulation, Vol. 30, No. 2, pp. 252-262, 2010, (Actapress).
- 5) **M. S. Widyan**, "On the Effect of AVR Gain on Bifurcations of Subsynchronous Resonance in Power System", International Journal of Electrical Power & Energy Systems, Vol. 32, pp. 656-663, 2010, (Elsevier).

- 6) **M. S. Widyan**, A. I. Al Tarabsheh, I. Y. Etier & R. E. Hanitsch, "Dynamic and Steady-State Characteristics of DC Machines Fed By Photovoltaic Systems", *International Journal of Modelling and Simulations*, Vol. 30, No. 3, pp. 353-360, 2010, (Actapress).
- 7) **M. S. Widyan**, "Dynamical and Steady-State Characteristics of DC Motors Powered By Photovoltaic Systems via DC-DC Buck-Boost Switch Mode Converter", *International Journal of Power and Energy Systems*, Vol. 30, No. 2, pp. 148-156, 2010, (Actapress).
- 8) **M. S. Widyan**, A. I. Al Tarabsheh, I. Y. Etier & R. E. Hanitsch, "Transient Analysis and Output Characteristics of DC Motors Fed by Photovoltaic Systems", *Jordan Journal of Mechanical and Industrial Engineering*, Vol. 4. No. 1, pp. 193-204, 2010, (The Hashemite University).
- 9) **M. S. Widyan** & A. M. Harb, "On the Effect of Turbine Governor Gain on Bifurcations of Subsynchronous Resonance in Power Systems", *International Journal of Modelling and Simulations*, Vol. 30, No.3, pp. 298-307, 2010, (Actapress).
- 10) **M. S. Widyan**, "Controlling Chaos and Bifurcations of SSR Using TCSC", *International Journal of Modelling and Simulations*, Vol. 30, No. 3, pp. 308-314, 2010, (Actapress).
- 11) S. M. Radaideh, **M. S. Widyan** & O. I. Alrahamneh, "Controlling SSR of the IEEE Second Benchmark Model Using TCSC and SSSC: A Comparative Study", *International Journal of Modelling and Simulations*. Vol. 31, No. 3, 2011, (Actapress).
- 12) A. I. Al Tarabsheh, I. Y. Etier & **M. S. Widyan**, "Investigating the Shunting Effects of Parallel-Connected a-Si:H Solar Cells", *International Journal of Sustainable Energy*, Vol. 32, No. 2, pp. 71- 77, April 2013, (Taylor & Francis).
- 13) **M. S. Widyan** & R. E. Hanitsch, "High-Power Density Radial-Flux Permanent-Magnet Sinusoidal Three-Phase Three-Slot Four-Pole Electrical Generator", *International Journal of Electrical Power and Energy Systems*, Vol. 43, pp. 1221-1227, 2012, (Elsevier).
- 14) **M. S. Widyan**, G. S. Marji & A. I. Al Tarabsheh, "Dynamic and Steady-State Operational Performance of Induction and Synchronous Reluctance Motors Powered by PV Generator with MPPT", *International Review of Automatic Control, Theory and Applications*, Vol. 5, No. 6, pp. 757-768, November 2012, (Praise Worthy Prize).
- 15) **M. S. Widyan**, "Controlling Chaos and Bifurcations of SMIB Power System Experiencing SSR Phenomenon Using SSSC", *International Journal of Electrical Power and Energy Systems*. Vol. 49, pp. 66-75, 2013, (Elsevier).
- 16) **M. S. Widyan** & R. E. Hanitsch, "Operating Point Stability Analysis of SMIB Power System Equipped with High PV Penetration", *International Journal of Electrical Power and Energy Systems*, Vol. 55, pp. 522-530, 2014, (Elsevier).
- 17) **M. S. Widyan**, A. M. Harb & O. M. Al-Oquili, "Transient and Steady-State Performance Analysis of Hybrid Powered DC Series Motor via DC Shunt and PV Generators with Maximum Power Point Tracking", *Electrical Engineering*, Vol. 95, No.4, 2013, (Springer).

- 18) **M. S. Widyan**, "Large- and Small-Signal Stability Performance of a Power System Incorporated with PV Generator", *International Journal of Power and Energy Systems*, Vol. 33, No. 4, pp.1-9, 2013, (Actapress).
- 19) **M. S. Widyan**, "Operational Performance of Synchronous Generator Hybrid-Excited by PMDC and PV Generators", *International Review of Electrical Engineering (IREE)*, Vol. 9, No. 4, pp. 863-872, 2014, (Praise Worthy Prize).
- 20) **M. S. Widyan**, "Operational Characteristics of Hybrid-Powered Three-Phase Induction Motor via Synchronous and PV Generators with MPPT Utilised by Synchronous Generator Automatic Voltage Regulator", *IET Renewable Power Generation*, Vol. 10, No. 1, pp. 1-9, 2015, (Institution of Engineering and Technology).
- 21) **M. S. Widyan**, "Modelling, Simulations and Operational Characteristics of a Stand-Alone Hybrid-Powered PMDC Motor for Pumping Applications", *International Journal of Power and Energy Systems*, Vol. 35, No. 1, pp.1-13, 2015, (Actapress).
- 22) M. M. Alomari, N. I. Alshdaifat & **M. S. Widyan**, "Energy Models for Analyzing the Economic Wide Impact of the Environmental Policies", *Energy and Power Engineering*, Vol. 2, No. 7, (2015), pp. 676.
- 23) M. M. Alomari, **M. S. Widyan**, N. I. Alshdaifat, A. W. Dirawieh, H. Alabdali, A. Saleh, W. Zaher, M. Al-Hwamdeh & M. Louy, "Modeling and Analysis of Wake Control System for Maximizing Wind Farm Energy". *International Journal of Renewable Energy & Environmental Engineering*, Vol. 3, No. 2 (2015), pp. 555.
- 24) **M. S. Widyan** & M. M. Alomari, "Modelling, Simulations and Operational Performance of Synchronous Motor Powered and Excited by Photovoltaic Generators with Fixed Injected Voltages", *International Journal of Power and Energy Conversion*, Vol. 7, No. 2, pp. 97-120, 2016, (Inderscience).
- 25) **M. S. Widyan**, M. M. Alomari & R. E. Hanitsch, "Loss of Excitation of SMIB Power System Equipped with High Photovoltaic Penetration with Constant Injected Voltage", *Electrical Engineering*, Vol. 98, 2016, (springer).
- 26) **M. S. Widyan**, "Operational Performance Stability of Grid-Connected Photovoltaic Generator via DC–DC Converter and 48-pulse Voltage Source Inverter", *International Journal of Modelling and Simulations*, pp.1-12, December 2016, (Taylor & Francis).
- 27) M. M. Alomari, **M. S. Widyan**, M. Abdul-Niby & A. Gheitasi, "Hopf Bifurcation Control of Subsynchronous Resonance Utilizing UPFC", *Engineering, Technology & Applied Science Research*, Vol. 7, Issue 3, pp. 1588-1594, 2017.
- 28) M. M. Alomari, M. Sabati, **M. S. Widyan** & N. I. Alshdaifat, "Modeling and Simulation for Bifurcations of SSR in Large Wind Farms", *International Journal of Renewable Energy Research (IJRER)*, Vol 7, No 3, 2017.

- 29) M. I. Abuashour, **M. S. Widyan**, T. O. Sweidan & M. A. Momani, "Modelling, Simulations and Operational Performance of a Stand-Alone Hybrid Wind/PV Energy System Supplying Induction Motor for Pumping Applications", International Journal of Engineering Systems Modelling and Simulations, Vol. 10, No. 1, pp. 12-25, 2018. (Inderscience).
- 30) T. O. Sweidan, **M. S. Widyan** & M. B. Rifai, "Perturbation and Observation as MPPT for Highly Penetrated Grid-Connected PV Generator Considering Three-Phase Fault", International Journal of Power and Energy Conversion, Vol. 10, No. 2, pp.225-240, March, 2019. (Inderscience).
- 31) **M. S. Widyan** & A. M. Harb, "Dynamical and Operational Performance of Shunt and Permanent-Magnet DC Motors Powered by Lead–Acid Batteries for Pumping Applications", Nonlinear Dynamics, Vol. 99, No. 1, pp.341-349, 2019.
- 32) Manar Qudah, Wejdan Abu Elhaija, **Mohammad Widyan**, "Performance analysis of different series compensation schemes of SMIB power system incorporating PV generator", International Transactions on Electrical Energy Systems, November 2020, pp. 1-16.

Conference Papers

- 1) A. M. Harb & **M. S. Widyan**, "Modern Nonlinear Theory as Applied to SSR of the IEEE Second Benchmark Model", IEEE Bologna Power Tech. 2003 Conference, June 23-26 2003, Bologna, Italy.
- 2) R. E. Hanitsch & **M. S. Widyan**, "Design, Construction and Test of a Permanent-Magnet Prototype Machine for Wind Energy Applications", 8th International Conference on Electrical Machines and Systems (ICEMS'05), 27-29 September 2005, Nanjing, China.
- 3) R. E. Hanitsch, **M. S. Widyan** & R. Grune, "Cogging Torque Reduction of a Novel Low-Speed High-Energy Permanent-Magnet Electrical Machine", Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM 2006), 23-26 May, 2006-Taormina, Italy.
- 4) **M. S. Widyan** & R. E. Hanitsch, "Directly Driven Rare-Earth Permanent-Magnet Electrical Machine Prototype For Wind Energy Applications", International University's Power Engineering Conference (UPEC 2007), 4-6 Sept. 2007, Brighton, UK.
- 5) **M. S. Widyan** & A. M. Harb, "Bifurcation Analysis of Subsynchronous Resonance of The IEEE Second Benchmark Model with TCSC", Modern Nonlinear Theory (MNT 2008), 2nd IASTED International Symposium, November 16-18, 2008 Orland, Florida, USA.
- 6) **M. S. Widyan**, A. I. Al Tarabsheh & I. Y. Etier, "Transient and Steady-State Characteristics of DC Machines Fed By Solar Cells", Global Conference on Renewable and Energy Efficiency for DEsert Regions 2009 (GCREEDER 2009), March 31 – April 2, 2009, Amman, Jordan.
- 7) **M. S. Widyan**, A. I. Al Tarabsheh, I. Y. Etier & R. E. Hanitsch, "Transient Analysis and Output Characteristics of DC Motors Fed By Photovoltaic Systems", International Conference and Exhibition on Green Energy & Sustainability For Arid Regions & Mediterranean Countries 2009, (ICEGES 2009), November 10-12, 2009, Amman, Jordan.

- 8) R. E. Hanitsch & **M. S. Widyan**, "Wind Energy Generation Units and Related Consequences on The Grid- A Short Survey", International Conference and Exhibition on Green Energy & Sustainability For Arid Regions & Mediterranean Countries 2009, (ICEGES 2009), November 10-12 2009, Amman, Jordan.
- 9) **M. S. Widyan**, "PV-Powered DC Motors", The National Campaign on Public Awareness For the Drivers of Change Workshop, The 15th Jordan Science Week "Science and Technology: Drivers of Change" Royal Scientific Society: Princess Sumaya University for Technology, May 10-12, 2010.
- 10) **M. S. Widyan**, "Modeling, Dynamic Characteristics and Steady-State Performance of ybrid Powered DC Shunt Motor via Photovoltaic and Permanent-Magnet DC Generators", The Third International Renewable Energy Congress (IREC 2011), Hammamet Tunisia, Tunisia, December 20-22, 2011.
- 11) **M. S. Widyan** & A. M. Harb, "Modeling, Simulation and Performance Characteristics of DC Series Motor Powered by Photovoltaic and DC Shunt Generators", The Third International Renewable Energy Congress (IREC 2011), Hammamet Tunisia, Tunisia, December 20-22, 2011.
- 12) G. S. Marji & **M. S. Widyan**, "Performance Characteristics of PV-Powerd DC Shunt and PM Motors Through DC-DC Converter", International Conference on Electrical Engineering and Control Applications (ICEECA 2012), Khenchela, Algeria, November 20-22, 2012.
- 13) **M. S. Widyan**, "Large-Disturbance Stability of Grid-Integrated Photovoltaic Generator with MPPT", International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM 2014), Ischia, Italy, June, 18-20, 2014.
- 14) M. M. Alomari, **M. S. Widyan**, A. W. Dirawieh, H. Alabdali, A. Saleh, W. Zaher, M. Al-Hwamdeh & M. Louy, "Maximizing Wind Farm Power Using Wake Control System", Proceeding of International Conference of Energy and Environment (ICEE 2014), Vol. 3, pp. 253-257, Beijing, China, June 26-27, 2014.
- 15) M. M. Alomari, N. I. Alshdaifat & **M. S. Widyan** "Energy Models for Analyzing the Economic Wide Impact of the Environmental Policies" ICEE 2015: International Conference on Energy and Economy, Paris, France, July 20-21, 2015.
- 16) T. O. Sweidan & **M. S. Widyan**, "Perturbation and Observation as MPPT Algorithm Applied on the Transient Analysis of PV-Powered DC Series Motor", 8th International Renewable Energy Congress (IREC 2017), March 21-23, 2017, Amman, Jordan.
- 17) **M. S. Widyan**, A. M. Harb & T. O. Sweidan, "Shunt Compensation of SMIB Power System Incorporated with Highly Penetrated Photovoltaic Generator", International Conference on Electrical and Computing Technologies and Applications, 2017 (ICECTA'2017), November, 21-23, 2017, American University of Ras AlKhaimah, Ras Alkhaimah, UAE.

18) **M. S, Widyan**, “On The Dynamics and Operational Performance Analysis of Lead-Acid Battery Interfaced to Electrical Grid”, International Conference on Innovative Applied Energy 2019 (IAPE'19), 14-15-, March 2019, Oxford, United Kingdom.