

Name: Ahmed Mohy-Eldeen Ibraheem Mohamad

Current Title (including department and university): Assistant Professor, Electrical Power and Machines Department, Ain Shams Univeristy

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FIELDS OF SPECIALIZATION

Modeling and analysis of Power electronic converter in power systems, DC power Systems, Microgrids, Motor Drives, Renewable Energy

DEGREES

- **Ph.D.**, Degree (Energy systems), University of Alberta, Dec.2018, Modeling, Stability Assessment, and Investigation of Interaction Dynamics in Active DC Distribution Systems
- **M.S.**, Degree (Electrical Engineering) , Ain-Shams University, 2014, Sparse Matrix Converters for Interfacing Variable Speed Generators with the Grid
- **B.S.E.E.**, Degree (Electrical Engineering), Ain-Shams University, 2010.

ACADEMIC AND INDUSTRIAL POSITIONS

- **Assistant Professor, Ain Shams University, Egypt** *(Dec. 2019 – present)*
 1. Teaching courses at I-CHEP and Specialized Programs: Electric Drives, Technical Report Writing, Electrical Machines, and Electromagnetic Fields.
 2. Supervision on capstone projects.
 3. Supervisor of two grad students.
 4. Academic advisor at Ain Shams University Credit Hour System: responsible for accreditation with **ACQUIN**
 5. Member of the Quality team responsible for Electrical Power engineering accreditation
 6. Faculty of Engineering Representative at Joint Institute for Nuclear Research (JINR)
- **Accreditation and Scientific Development Manager at TAQNOR Lighting, Cairo, Egypt (Part-time)** *(Spet.2021-July. 2022)*
 1. Responsible for product accreditation with consultants in Egypt and the Middle East
 2. Developing new products and improving existing ones.
- **Assistant Professor, Future University in Egypt (Part-time)** *(Feb.2020-present)*
 1. Lecturer: Electrical Installation for Civil Engineering, Electric Drives, Power System Planning.
 2. Graduation Project supervisor
- **Postdoctoral Fellow, University of Alberta** *(Jan. 2019 – Nov. 2019)*
 1. Analyzing and characterizing the impact of wind turbines detailed model on the dynamics of MTDC.
 2. Training grad students on implementing typical power systems using Opal RT and dSPACE1104.
- **Research Assistant (PhD Program), University of Alberta** *(Jan. 2015 – Dec. 2018)*
 1. Developed methods for islanding detection in DC Networks, based on the positive feedback concept, to follow IEEE Std. 1547 for safety and protection purposes.
 2. Investigated the dynamics of DC distribution systems with the help of classic linear control tools (e.g. small-signal modelling, frequency response, and Nyquist plots) and nonlinear control tools (e.g. Bifurcation Analysis) and proposing different solutions to enhance the system stability.

3. Studied the impact of including the mechanical dynamics of wind turbine generators (PMSGs) on the DC system overall stability and proposing stabilization strategies to enhance the overall system damping capabilities.
 4. Designed and implemented experimental laboratory-scale setups of electrical power circuits.
 5. Designed and implemented control and stabilization loops of AC/DC controlled rectifiers, electrical motor drives, and DC/DC converters.
 6. Verified the theoretical results through
 - i. Detailed non-linear simulations under the Matlab/Simulink environment.
 - ii. Hardware (control)-in-loop real-time simulation studies via Opal-RT platform.
 - iii. Experimental laboratory-scale setups (Semikron converters and dSPACE).
 7. The first author of 6 IEEE journal papers.
- **Teaching Assistant, University of Alberta** *(Jan. 2015 – Dec. 2018)*
 1. Lab Instructor, TA, and marker for *Power Electronics* and *Variable Speed Drives*.
 2. Helped students to understand and apply courses theoretical material in lab sessions using typical industrial equipment (PLX15 DC Drive, PowerFlex 70 AC Drive, Allen-Bradley Induction Machine, and Power quality analyzer).
 3. Winner of *L.E. Gads award* for teaching excellency (nominated by students).
 - **Scribe and Reader, Accessibility Resources Exam Office, University of Alberta** *(Dec. 2017 – Dec. 2018)*
 1. Professionally helped students with disabilities to scribe their exams.
 2. Helped in handing-in and -out exams to students and professors using advanced customer services skills.
 3. Proctored and accommodated students with disabilities and chronic health conditions.
 - **Teaching Assistant, Ain Shams University, Egypt** *(Jan. 2011 – Dec. 2014)*
 1. Taught several power system courses (Electrical Circuits, Electrical Measurements, Energy Conversion Systems, Induction Machines, Transmission and Distribution of Electrical Energy, Power System Analysis and Power Electronics).
 2. Co-supervisor of capstone projects.
 3. Prepared theoretical material and co-supervision of Power Electronics, Electrical Machines, Power Systems, Protection, High Voltage, Automation (ABB PLCs and ABB VSDs), and Electrical Measurements labs.
 4. Point of contact at the Electrical Power and Machines Department to ensure the department is following the Quality Assurance Unit instructions for international accreditation.
 5. Prepared classes and exams schedules at the Exams Office.
 - **Research Assistant (MSc Program)** *(Sept. 2010 – Apr. 2014)*
 1. Proposed a control strategy for Sparse Matrix Converter (SMC), based on a pulse-width modulation strategy, for integrating of wind turbine generators with the electrical grid, leading to a simple active and reactive power control.
 2. Proposed an active damping control method, utilizing the voltage of the AC grid to increase the system stability margins.
 3. Conducted time-domain non-linear simulations under the Matlab/Simulink environment to investigate the proposed system.

CONSULTANT

- August 2022, Electrical Power Design Department Head

AWARDS

- L.E. Gads Teaching Assistant Award (Nominated by students) *(May 2017)*
- University of Alberta Doctoral Recruitment Scholarship (Nominated by University of Alberta) *(Jan. 2015)*

PROFESSIONAL RECOGNITION

Journal papers:

1. **A.M. I. Mohamad**, M. F. M. Arani, and Y. A. I. Mohamed, "Investigation of Impacts of Source Dynamics and Stability Options in DC Power Systems with Wind Energy Conversion Systems," *IEEE Access.*, pp. 18270-18283, 2020.
 2. **A. M. I. Mohamad and Y. A. I. Mohamed**, "Assessment of Stabilization Solutions for DC Microgrid with Dynamic Loads," *IEEE Trans. Smart Grids*, vol. 10, no. 5, pp. 5735–5747, 2019.
 3. **A. M. I. Mohamad and Y. A. I. Mohamed**, "Investigation and Enhancement of Stability in Grid-Connected Active DC Systems with High Penetration Level of Dynamic Loads," *IEEE Trans. Power Electron.*, vol. 34, no. 9, pp. 9170–9190, 2018.
 4. **A. M. I. Mohamad and Y. A. I. Mohamed**, "Impedance-Based Analysis and Stabilization of Active DC Distribution Systems with Positive Feedback Islanding Detection Schemes," *IEEE Trans. Power Electron.*, vol. 33, no. 11, pp. 9902–9922, 2018.
 5. **A.M. I. Mohamad and Y. A. I. Mohamed**, "Analysis and Mitigation of Interaction Dynamics in Active DC Distribution Systems with Positive Feedback Islanding Detection Schemes," *IEEE Trans. Power Electron.*, vol. 33, no. 3, pp. 2751–2773, 2018.
 6. **A.M. I. Mohamad and Y. A. I. Mohamed**, "Assessment and Performance Comparison of Positive Feedback Islanding Detection Methods in DC Distribution Systems," *IEEE Trans. Power Electron.*, vol. 32, no. 8, pp. 6577–6594, 2017.
 7. **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*, vol. 73, pp. 340-349, 2015.
- **Conferences**
A. M. I. Mohamad, M. I. Marei, and A. A. El-Sattar, "A Simple Control System for Sparse Matrix Converter to Interface PMSG with the Grid", *Proceedings of 16th International Middle East Power Systems Conference*, Dec. 2014.

References:

1. **Dr. Mostafa Marei**
2. **Dr. Yasser Mohamed**
3. **Dr. Ibraheem Helal**