

Curriculum Vitae

Ahmad Mohammad Saber ABDELSAMIE

Contact Information

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Location: Toronto, Canada | **LinkedIn:** Ahmad Mohammad Saber | **Scholar:** Ahmad Mohammad Saber

Education

Ph.D. in Engineering with concentration in Electrical & Computer Engineering 01/2020 – 05/2024

Institution: Khalifa University of Science and Technology, UAE

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Thesis Title: Developing Cyber-Immune Line Current Differential Relays Using the Relay Measurements, Machine Learning, and Physical Models

Advisors: Professors Ehab El-Saadany, Hatem Zein Eldin, and Davor Svetinovic

International Visiting Graduate Student (Non-Degree)

08/2023 – 12/2023

Institution: Department of Electrical & Computer Engineering, University of Toronto, Canada

Advisor: Professor Deepa Kundur

M.Sc. in Electrical Power & Machines Engineering

03/2017 – 10/2019

Institution: Faculty of Engineering, Cairo University, Egypt

Thesis Title: A Hybrid Wind-Wave Energy System with Batteries for Offshore Oil and Gas Platforms

Advisors: Professor Doaa K. Ibrahim, and Associate Professor Tarek A. Boghdady

B.Sc. in Electrical Power & Machines Engineering

09/2011 – 07/2016

Institution: Faculty of Engineering, Ain Shams University, Egypt

Work Experience

Postdoctoral Fellow, University of Toronto, Toronto, Canada

07/2024 – Present

Supervisor: Deepa Kundur (Professor and Chair, The Edward S. Rogers Sr. Department of Electrical & Computer Engineering, University of Toronto)

- Leading and contributing to cutting-edge research projects in collaboration with Hydro-Québec Research Institute (IREQ) and Xanadu Quantum Technologies.

- Preparing and submitting high-quality research papers to reputable journals and conferences.

- *Supervision:* 1) mentoring 4 graduate students, 2) supervising one undergrad student with their B.Sc. thesis, and 3) co-supervising a research associate at another university.

- *Teaching Assistant Service:* ECE 1508 - *Special Topics in Communications: Applied Deep Learning*, instructed by Dr. Ali Bereyhi, Fall 2024: supervising a group of grad students with the coursework projects.

Graduate Research and Teaching Assistant, Khalifa University, UAE

01/2020 – 5/2024

- Contributed to the university's international ranking through rigorous research and publication.

- Assisted with teaching several courses with the ECE Department.

Electrical & Controls Engineer, Veolia Water Technologies, Cairo, Egypt

11/2018 – 12/2019

- Took part in doing all the electrical and control engineering work in both tendering and engineering (contract) phases of the Water/Waste treatment/desalination plants.

- Drew up plans using computer-assisted engineering and design software.

- Estimated material, construction, and labor costs, and project timescales.

- Coordinated draftsmen and technicians writing reports and documentation.
- Attended meetings and giving presentations.
- Supported the implementation of the QHSE Management System as per standards (ISO 9001, 14001, and OHSAS 18001).

Worked with: Ahmed Kamar (Electrical Manager)

Business Development Engineer, AHARAM Security Group (ASG), Cairo, Egypt 02/2018 – 11/2018

- Led initiatives to drive organizational growth and increase profitability.
- Managed cross-functional projects to improve internal operations and engage key market influencers.
- Expanded new business opportunities across Egypt.
- Established strategic partnerships and collaborations.
- Supported sales and marketing for new product launches.
- Developed and maintained corporate databases.

Worked with: Amr Rabea (Business Development Manager)

Electrical Design and Quality Control Engineer, Elsewedy Electric, Egypt 02/2017 – 02/2018

- Designed dry-type transformers up to 15 MVA, including detailed drawings, bills of quantity, and cost sheets.
- Conducted quality control and material inspections for large transformers (40, 125, 175 MVA).
- Coordinated with various departments to address technical issues.
- Participated in root-cause analysis and investigations of problems.

Worked with: Mostafa Yousif (Quality Control Manager) and Enas Amer (Dry-type Design Director)

Publications

Peer-Reviewed Journal Articles

- [1] **A. M. Saber**, A. Youssef, D. Svetinovic, H. H. Zeineldin and E. F. El-Saadany, “Unmasking Covert Intrusions: Detection of Fault-Masking Cyberattacks on Differential Protection Systems,” in *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2024, doi: 10.1109/TSMC.2024.3456810.
- [2] D. M. Manias, **A. M. Saber**, M. I. Radaideh et al., “Trends in Smart Grid Cyber-Physical Security: Components, Threats and Solutions,” in *IEEE Access*, 2024, doi: 10.1109/ACCESS.2024.3477714.
- [3] **A. M. Saber**, A. Youssef, D. Svetinovic, H. H. Zeineldin and E. F. El-Saadany, “Cyber-Immune Line Current Differential Relays,” in *IEEE Transactions on Industrial Informatics*, vol. 20, no. 3, pp. 3597-3608, Mar. 2024, doi: 10.1109/TII.2023.3310769.
- [4] **A. M. Saber**, A. Youssef, D. Svetinovic, H. H. Zeineldin and E. F. El-Saadany, “Anomaly-Based Detection of Cyberattacks on Line Current Differential Relays,” in *IEEE Transactions on Smart Grid*, vol. 13, no. 6, pp. 4787-4800, Nov. 2022, doi: 10.1109/TSG.2022.3185764.
- [5] **A. M. S. Abdelsamie**, T. A. Boghdady and D. Ibrahim, “Multi-objective Sizing of a Standalone Renewable Power System for Offshore Oil and Gas Applications,” *International Journal of Renewable Energy Research (IJRER)*, vol. 11, no. 2, pp. 456-468, June 2021.

Conference Proceedings

- [1] **A. M. Saber**, A. Selim, M. H. Hammad, A. Youssef, D. Kundur and E. F. El-Saadany, “A Novel Approach to Classify Power Quality Signals Using Vision Transformers,” accepted to *IECON 2024- 50th Annual Conference of the IEEE Industrial Electronics Society, Chicago, Illinois, U.S.A., 2024*, URL: <https://doi.org/10.36227/techrxiv.172503656.69589385/v1>
- [2] A. Kemmeugne, A. S. Mohamed, **A. M. Saber** and D. Kundur, “Integration of Software-Defined Networking and Line Outage Distribution Factors for Enhancing the Cyber Resilience of Modern Transmission Systems,” accepted to *IECON 2024- 50th Annual Conference of the IEEE Industrial Electronics Society, Chicago, Illinois, U.S.A., 2024*.
- [3] **A. M. Saber**, A. Youssef, D. Svetinovic, H. H. Zeineldin, Deepa Kundur and E. F. El-Saadany, “Enhancing Power Quality Event Classification With AI Transformer Models,” *2024 IEEE Power & Energy Society General Meeting (PESGM)*, Seattle, WA, USA, 2024, pp. 1-5, doi: 10.1109/PESGM51994.2024.10688689.

- [4] **A. M. Saber**, A. Youssef, D. Svetinovic, H. Zeineldin and E. El-Saadany, “Learning-Based Detection of Malicious Volt-VAr Control Parameters in Smart Inverters,” *IECON 2023- 49th Annual Conference of the IEEE Industrial Electronics Society, Singapore, Singapore, 2023*, pp. 1-6.
 - [5] **A. M. Saber**, A. Selim, V. Kadkikar, H. Zeineldin and E. El-Saadany, “Fast Deep-Learning-Based Recognition of Multiple Power Quality Events Under Noise and DC Offset,” *2023 IEEE Conference on Power Electronics and Renewable Energy (CPERE), Luxor, Egypt, 2023*, pp. 1-6.
 - [6] M. E. Kotb, **A. M. Saber** and T. A. Boghdady, “Simple Robust Line Current Differential Protection Against Cyberattacks,” *2022 23rd International Middle East Power Systems Conference (MEPCON), Cairo, Egypt, 2022*, pp. 1-7, doi: 10.1109/MEPCON55441.2022.10021802.
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Digital and Technical Skills

- Software tools: PSCAD/EMTDC, MATLAB/SIMULINK, Python, C++, OPAL-RT, RT-LAB, LAtEX.
 - AI assistant tools: ChatGPT, Claude, Gemini, Microsoft Copilot, Jasper.
 - Smart Grid-related skills: Differential Protection, Power Systems Protection, Power Systems Modelling, DER Modelling, Distributed Generation.
 - Security-related skills: Power Systems cybersecurity, Intrusion Detection, Cyber-Physical Security.
 - AI-related skills: Applied Machine Learning, Deep Learning, Time Series Analysis, Sequential Data Analysis.
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Language Skills

English: Fluent | **Arabic:** Native | **French & German:** Elementary

Invited Seminar

“How to Use Machine & Deep Learning to Secure Vulnerable Power System Components Against Cyberattacks”
29 April 2024, invited by the Advanced Power and Energy Center, Khalifa University, UAE

Scholarships and Fellowships

- **07/2024 – present:** Postdoctoral Fellow, with Professor Deepa Kundur, University of Toronto, Toronto, Canada.
 - **01/2020 – 05/2024:** Khalifa University’s Graduate Research/Teaching Assistant Scholarship (for international students).
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Awards and Recognition

In Academia:

- **2023:** Outstanding Graduate Student (for publishing in a top 1% venue as ranked by Scopus) by Khalifa University’s Graduate Studies Office.
- **2022:** Outstanding Graduate Student (for high GPA and for publishing in a top 2% venue as ranked by Scopus) by Khalifa University’s Graduate Studies Office.

Recognition by Governments:

- **UAE:** received the UAE’s Golden Residency, for specialized talent of national interest.
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Organizational Memberships

- **2021 – present:** Member, Institute of Electrical and Electronics Engineers (IEEE)
 - **2024 – present:** Member, IEEE Power & Energy Society
 - **2024 – present:** Member, IEEE Industrial Electronics Society
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Voluntary Service As An Academic Reviewer

Reviewed papers for reputable journals and conferences such as: IEEE Transactions on Smart Grid, IEEE Transactions on Industrial Informatics, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Secure and Dependable Computing, IEEE Internet of Things Journal, IEEE Transactions on Power Delivery, IEEE systems journal, IEEE Power and Energy Society General Meeting, IEEE ISGT, IEEE Access, and IET Cyber-Physical Systems: Theory & Applications.

References are available upon request.