

SAMER EL KABABJI, PhD, P.Eng.

Assistant Professor, Data Science Department | Princess Sumaya University for Technology

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ACADEMIC AND PROFESSIONAL PROFILE

Assistant Professor and registered Professional Engineer with a multidisciplinary academic background and more than two decades of practical engineering, operational, commercial, and executive leadership experience. Experience spans pharmaceutical manufacturing, plastics processing, industrial maintenance, oil and gas, welding technologies, technical sales, distribution, automation, smart buildings, and applied machine learning. This industry foundation informs teaching and research in data science, artificial intelligence, healthcare analytics, electrical and computer engineering, robotics and control, industrial engineering, and engineering management. Research focuses on machine learning, synthetic and longitudinal health data, clinical trials, medical AI, smart grids, and time-series analysis.

PRACTICE-BASED STRENGTHS

Engineering operations and maintenance • Industrial automation and controls • Technical sales and market development • Profit-and-loss and team leadership • Channel and product-line strategy • Oil-and-gas technologies • Smart buildings and IoT • Applied machine learning and data engineering

INDUSTRY, ENGINEERING, AND LEADERSHIP EXPERIENCE

Founder | *Smartegrators Ltd., London, Ontario, Canada*

2015–2022

- Directed the design and integration of smart technologies for residential and commercial facilities, including a three-branch automotive dealership.
- Customized automation, security, and building-control systems to improve user convenience, monitoring, and operational reliability.
- Established a Honeywell dealership and expanded the company's smart-security offering.
- Completed an applied machine-learning project to predict gait speed in older adults from synchronized wearable-sensor time-series data, including preprocessing, signal alignment, and data-quality handling.

General Manager | *Specialized Gulf Welding Co., Dammam, Saudi Arabia*

2013–2015

- Led approximately 30 employees and returned the business to profitability through strategic and operational restructuring.
- Applied the Pareto 80/20 principle to reduce overhead, focus resources, and improve operating efficiency.
- Created new revenue streams through equipment rental and customized product-assembly lines.
- Restructured distribution channels and commercial processes to increase sales and strengthen market coverage.

Country Manager | *ITW Welding Products Group, Dammam, Saudi Arabia*

2005–2013

- Directed country-level business development and commercial strategy for the Miller and Hobart welding brands.
- Applied ITW Market Segment Focus and Product Line Simplification methods to prioritize markets, streamline offerings, and support substantial revenue growth.
- Restructured distribution channels, moved beyond exclusive arrangements, and strengthened customer service and market access.
- Served as an advisory member of ITW's global oil-and-gas innovation team, contributing regional market and application expertise.

Assistant General Manager | *Mona Trading, Dubai, United Arab Emirates*

2001–2003

- Managed three branches and approximately 100 employees across technical sales, distribution, service, and customer support.
- Oversaw product portfolios covering woodworking machinery, arc-welding equipment, and construction machinery.

Marketing Manager | *EDGO Group / GDTE, Muscat, Oman*

1997–2001

- Promoted, specified, and supported engineered products for oil-and-gas customers and projects.
- Worked with electrical submersible pumps, valves, actuators, instrumentation, flare systems, gas compressors, pipeline scrapers, corrosion monitoring, medium-voltage switchgear, metering, and SCADA systems.
- Connected customer operating requirements with appropriate technical solutions and supplier capabilities.

Maintenance Manager <i>Alnejma Bulk Pharmaceutical Company, Amman, Jordan</i>	1994–1997
- Implemented preventive-maintenance and instrument-calibration programs for a batch-processing pharmaceutical plant in accordance with Good Manufacturing Practices. - Coordinated with production teams to introduce Total Productive Maintenance practices and reduce production interruptions. - Supported reliable operation of process equipment while maintaining safety, quality, and regulatory requirements.	
Maintenance Engineer <i>Arab Drip Irrigation Systems Manufacturing, Amman, Jordan</i>	1993–1994
- Maintained extrusion production lines, injection-molding machines, chillers, and associated plant equipment. - Designed and implemented an online printing-control solution for irrigation hoses.	

ACADEMIC AND RESEARCH EXPERIENCE

Assistant Professor, Data Science Department <i>Princess Sumaya University for Technology, Amman, Jordan</i>	Sep 2025–Present
- Teach Data Engineering, Software Engineering, and Probability and Statistics at undergraduate and graduate preparatory levels. - Develop lectures, assignments, assessments, and hands-on laboratories emphasizing data pipelines, preprocessing, software practice, and applied analytics workflows. - Bring industrial case experience into teaching to connect data-science methods with engineering, operations, automation, and management applications. - Received strong student evaluations for subject knowledge, engagement, and supportiveness.	
Associate Scientist <i>CHEO Research Institute, Ottawa, Canada</i>	Jan–Sep 2025
- Developed pysdg, a Python package for generating synthetic tabular datasets using multiple machine-learning methods, including transformer-based and diffusion models. - Investigated synthetic-data augmentation for under-enrolled clinical trials and supported quantitative model development.	
Postdoctoral Associate <i>CHEO Research Institute / University of Ottawa, Ottawa, Canada</i>	May 2022–Dec 2024
- Developed the Fuzzy SQL package for comprehensive testing and comparison of generative models. - Designed and validated synthetic-data workflows for structured and longitudinal clinical-trial datasets. - Created a synthetic-data framework to support insufficiently accruing clinical trials. - Led benchmark optimization, reproducibility, and evaluation activities to strengthen machine-learning research quality.	
Graduate Teaching Assistant <i>Western University, London, Ontario, Canada</i>	Sep 2019–Apr 2020
Guided engineering students in software-engineering practices for capstone projects.	
Research Assistant <i>The University of Jordan, Amman, Jordan</i>	Nov 1991–Aug 1992
Contributed to ECG data-acquisition design and implementation, ECG pattern recognition, and signal-processing research.	

EDUCATION

PhD, Electrical and Computer Engineering <i>Western University, London, Ontario, Canada</i>	2018–2021
Specialization: Power Systems Engineering and machine-learning applications. Dissertation: Generative Learning in Smart Grid. Ontario Graduate Scholarship (2019, 2020); Outstanding Graduate Presentation Award (2019, 2021).	
MEng, Electrical and Computer Engineering <i>Western University, London, Ontario, Canada</i>	2016–2018
Specialization: Robotics and Control.	
MSc, Industrial Engineering / Administration <i>The University of Jordan, Amman, Jordan</i>	1992–1995
Specialization: Management. Thesis: Design of a Computerized Maintenance Management System Using Structured Modelling Methodology.	
BSc, Electrical Engineering <i>The University of Jordan, Amman, Jordan</i>	1986–1991

SELECTED PEER-REVIEWED PUBLICATIONS

Full publication list available through Google Scholar and ORCID.

- Huet-Dastarac, M., Dankar, F. K., Liu, D., El Kababji, S., Pilgram, L., & El Emam, K. (2026). An evaluation of pretrained generative models for augmenting small health data: Comparative modeling study. *Journal of Medical Internet Research*, 28, e88678. <https://doi.org/10.2196/88678>
- El Kababji, S., et al. (2025). Augmenting insufficiently accruing oncology clinical trials using generative models: Validation study. *Journal of Medical Internet Research*, 27, e66821. <https://doi.org/10.2196/66821>

- Pilgram, L., El Kababji, S., Liu, D., & El Emam, K. (2025). Magnitude and impact of hallucinations in tabular synthetic health data on prognostic machine learning models: Validation study. *Journal of Medical Internet Research*, 27, e77893.
- Liu, D., El Kababji, S. E., et al. (2025). Augmenting small tabular health data for training prognostic ensemble machine learning models using generative models. *BMC Medical Informatics and Decision Making*, 25(1).
- Mosquera, L., et al. (2023). A method for generating synthetic longitudinal health data. *BMC Medical Research Methodology*, 23(1).
- El Kababji, S., et al. (2023). Evaluating the utility and privacy of synthetic breast cancer clinical trial data sets. *JCO Clinical Cancer Informatics*, 7, e2300116.
- El Kababji, S. E., & Srikantha, P. (2020). A data-driven approach for generating synthetic load patterns and usage habits. *IEEE Transactions on Smart Grid*, 11(6), 4984–4995.

TECHNICAL AND ENGINEERING EXPERTISE

- **Programming and data science:** Python, R, MATLAB; pandas, NumPy, SciPy, scikit-learn, TensorFlow, Keras, PyTorch, XGBoost, LightGBM, statsmodels, OpenCV, SHAP, Optuna.
- **Synthetic data and MLOps:** Synthcity, SDV, MLflow, Git, Docker.
- **Power, control, and automation:** Simulink, control-system design, MATPOWER, pandapower, PySpice, instrumentation, industrial maintenance, and calibration.
- **IoT and smart buildings:** Home Assistant, AppDaemon, MQTT, Zigbee, Z-Wave, building automation, and smart-security integration.
- **Industrial applications:** Pharmaceutical batch processing, extrusion, injection molding, welding systems, oil-and-gas equipment, SCADA, and technical product specification.

PROFESSIONAL REGISTRATION, CERTIFICATIONS, AND CODES

- Professional Engineer (P.Eng.), Ontario
- Red Seal Electrician, Skilled Trades Ontario
- Certified Welding Inspector (CWI), American Welding Society (2008–2014)
- Codes and standards experience: Canadian Electrical Code (C22.1), IEC 60364, API Standard 1104, ASME B31.3, and AWS D1.1.

SELECTED PROFESSIONAL DEVELOPMENT

- Biomedical Research Ethics Tutorial, Children’s Hospital of Eastern Ontario (N2), 2022.
- Teaching Assistant Training Program, Western University, 2019.
- Laboratory Safety, Hazardous Waste Management, and WHMIS, Western University, 2018.
- ITW management programs: 80/20 Philosophy, Product Line Simplification, Understand-Simplify-Act, In-Lining, and Market Rate of Demand, 2011.