

Ahmed M. Elkholy

Electrical Power Engineer | Power-System Studies, Modelling & Engineering Software

ahmed_elkholy@f-eng.tanta.edu.eg | ahm_elkholy@outlook.com

LinkedIn | GitHub | ORCID | Google Scholar

Profile

Electrical power engineer with experience in transformer commissioning tests, equipment modelling, reactive-power compensation and ETAP studies for industrial and PV projects. Researcher at MPEI and Assistant Lecturer at Tanta University, pursuing a PhD with completion expected in December 2026. Also contributes to utility equipment specifications and develops power-system analysis software in Julia and Python.

Engineering Experience

Researcher / R&D Engineer — MPEI, Industrial Electronics Department | October 2023–present

- **Zigzag-transformer commissioning and modelling:** Participated in zigzag-transformer commissioning tests and developed a variable-impedance model in MATLAB/Simulink using test measurements. Compared model predictions with measured system behaviour at 50 Hz.
- **Thyristor-switched SVC:** Contributed to modelling and performance assessment of a departmental 50 kvar, 0.4 kV prototype, using R to analyse two months of distribution-grid operating data. The device uses a tap-switched transformer and capacitor with IoT telemetry.
- **Shunt regulation:** Developed power-circuit and Simulink/Simscape Electrical models, a phase-power calculation module, and genetic-algorithm coordination of two compensators on the IEEE 13-bus feeder in simulation.

Independent Power-System Studies — ETAP | Project-based, 2024–present

- Prepared load-flow, short-circuit, arc-flash and protection-setting studies for industrial and PV projects, with engineering reports for client review.
- Evaluated a capacitor bank with 7% detuned reactors for a 480 V motor control centre, comparing load flow with and without compensation and reviewing protection.
- Analysed short-circuit levels for a PV installation with vanadium, lithium-ion and lead-acid battery sources across seven operating scenarios.

Engineering Specifications Contributor — Power Consult | Project-based, 2026–present

- Contribute to material specifications and inspection/test plans for energy-storage and controller equipment on a Saudi utility project, currently under committee review.
- Resolve technical review comments, revise specifications and maintain standards references and meeting actions.

Engineering Software and Planning

AIMORA — lead developer | 2026–present

- Developing a modular Julia platform for power-system analysis, with current work on EMT simulation, line, cable and transformer parameters, project/study interfaces and numerical tests.
- Public components: AIMORA.jl, Platform and Resources. Broader study modules and the desktop client are planned.

EV fast-charging corridor planning — lead author and software developer

- Developed Python genetic-algorithm software to locate and size fast chargers under traffic, grid, storage and renewable-energy constraints. Evaluated five scenarios over a 669 km motorway corridor, with 50 runs in total; published the simulation study in *Electric Power Systems Research*.

Other tools: IEEE13-optimization, for unified power controller settings; Zthevenin, for Thevenin-impedance calculations in MATLAB.

Technical Skills

- **Power-system studies:** ETAP, NEPLAN, DigSILENT PowerFactory and PSCAD; load flow, short circuit, arc flash, protection settings, capacitor compensation, PV and battery-source scenarios; small-signal and transient stability, harmonic analysis.
- **Modelling and analysis:** MATLAB/Simulink, Simscape Electrical, parameter fitting from measurements, genetic algorithms, unbalanced distribution networks.
- **Power electronics:** thyristor-based compensation, shunt regulators, arc-suppression devices and power quality.
- **Programming and documentation:** Python, Julia, R, SQL, Git/GitHub and LaTeX; engineering reports, specifications and inspection/test plans.

Education and Academic Appointments

PhD studies in Electrical Engineering — MPEI, Russia | In progress; expected December 2026

Research: managing operating conditions in distribution networks with unbalanced loads using shunt regulation devices. Supervisor: Prof. Dmitry I. Panfilov.

MSc in Electrical Power and Machines Engineering — Tanta University | 2016–2019

Thesis: *Islanding Scenarios for High Reliable Operation of Distribution Networks*. Supervisor: Prof. Ahmed Refat Azmy.

BSc in Electrical Power and Machines Engineering — Tanta University | 2009–2014

Renewable-energy project: *The Impact of Large Wind Energy Penetration on the Performance of Electric Power Systems*. Supervisor: Prof. Ahmed Refat Azmy. Grade: Excellent (99%).

Assistant Lecturer — Tanta University | July 2019–present

Tutorials, laboratory teaching, assessment and student project supervision. Previously **Demonstrator**, March 2016–July 2019.

Selected Publications

Full publication list: Google Scholar.

1. A. M. Elkholy, D. I. Panfilov, A. N. Rozhkov, A. V. Badalyan, I. A. Cherdintsev. **Statistically robust genetic algorithm planning of EV fast-charging corridors under grid and storage constraints.** *Electric Power Systems Research*, 2026, vol. 261, art. 113505 (December issue). DOI
2. A. M. Elkholy, A. V. Chasov, D. I. Panfilov. **Statistical approach to non-invasive modeling of zigzag transformers using variable impedance.** *e-Prime*, 2025, vol. 14, art. 101135. DOI
3. R. N. Krasnoperov, D. I. Panfilov, M. G. Astachev, A. M. Elkholy. **Performance evaluation of a low-voltage SVC utilizing IoT streamed data for distribution systems.** *Electric Power Systems Research*, 2025, vol. 239, art. 111187. DOI
4. A. M. Elkholy, D. I. Panfilov, M. G. Astachev. **Arc Suppression Devices for Mitigating Single Line-to-Ground Faults and Enhancing Power System Resilience.** *IEEE Transactions on Industry Applications*, 2026, vol. 62, no. 1, pp. 596–607. DOI

Languages and Professional Development

Languages: Arabic (native); English (professional working proficiency); Russian (basic to intermediate).

Programming for Data Science for Enterprise Nanodegree, Udacity (2019); Faculty and Leadership Development Centre, Tanta University (2019); Egyptian Engineers Syndicate member since 2014.



Website



LinkedIn



Google Scholar



GitHub



YouTube