

MOHAMED KAMEL ELSHAARAWY

Civil Engineer | Assistant Lecturer

Short Bio

Mohamed Kamel Elshaarawy is an Assistant Lecturer of Civil Engineering at Horus University-Egypt (HUE) and a Ph.D. candidate in Irrigation and Hydraulics Engineering at Tanta University. He holds B.Sc. (2018, Excellent with Honors) and M.Sc. (2024) degrees from Port Said University, specializing in hydraulics, water resources management, and structural design. His research applies machine learning, optimization, and computational fluid dynamics to seepage control, saltwater intrusion, hydraulic structures, groundwater systems, and concrete performance. Mohamed has authored more than 35 peer-reviewed publications, serves as an active reviewer for several international journals, and contributes actively to teaching and research at HUE.



Contact Information & Research Profiles

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|--|---------------|---|------------------|
| Mubarak Street, P(4/11), Z(1), D(4), New Damietta, Egypt | | melshaarawy@horus.edu.eg; m.kamel35@gmail.com | |
| +201280961080 01033476255 | | https://www.linkedin.com/in/mohamed-kamel-elshaarawy-543444132/ | |
| ORCID | Research Gate | Google Scholar | Scopus |
| | | Web of Science | Semantic Scholar |

Education

- Doctor of Philosophy in Engineering** (Irrigation and Hydraulics Engineering) [Dec 2024 – Present]
University: Tanta University, Tanta, Egypt
- Master of Science in Civil Engineering** (Irrigation and Hydraulics Engineering) [Aug 2019 – Apr 2024]
University: Port Said University, Port Said, Egypt
Thesis Title: Hydraulic Comparison of Different Types of Lining for Irrigation Canals Using Computational Fluid Dynamics Models
- Bachelor of Science in Engineering** (Civil Engineering) [Sep 2013 – July 2018]
University: Port Said University, Port Said, Egypt | **Overall Grade:** Excellent with Honors
Graduation Project: Survey and Highways Project | **Project Grade:** Excellent

Research Interests

Machine Learning | Water Resources Management | Groundwater Modeling | Hydraulic Engineering | Structural Engineering

Work Experience

- Civil Engineering Department, Faculty of Engineering, Horus University-Egypt (HUE), New Damietta 34517, Egypt**
Job: Demonstrator (Oct 2020 – July 2024); Assistant Lecturer (July 2024 – Current) | 5 years of experience
 - Key responsibilities**
 - Assist in academic registration and advised students on course requirements and academic development.
 - Support course instructors by helping with course content, conducting practical sessions, and demonstrating engineering equipment and software.
 - Evaluate and grade student performance on assignments, exams, quizzes, and lab reports while providing constructive feedback.
 - Maintain regular office hours, respond to student inquiries, and facilitate review sessions to aid student comprehension.
 - Collaborate with faculty on teaching materials and maintain lab equipment.

• **Teaching courses**

- **Civil Engineering Program:** Hydraulics 1, Hydraulics 2, Hydrology, Civil Drawing, Design of Irrigation Structures, Engineering Surveying, Environmental Engineering, Irrigation and Drainage Engineering
- **Architectural Engineering Program:** Engineering Surveying for Architect, Reinforced Concrete and Foundation
- **Level 0:** Engineering Drawing and AutoCAD sessions

• **Administrative memberships**

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| - Central Study Timetable Committee | [Aug 2024 | – | Present] |
| - Final Examination Schedule Preparation Committee | [Nov 2021 | – | Present] |
| - New Bylaw Creation and Revision Committee | [July 2024 | – | Sep 2025] |
| - Civil Engineering Department Study Timetable Committee | [Aug 2022 | – | Aug 2024] |
| - Leadership and Governance Quality Standards Committee | [Oct 2023 | – | Apr 2024] |
| - Simulation and Grant Review for ISO Certification | [Jan 2024 | – | Feb 2024] |
| - ISO Executive Committee | [Apr 2023 | – | Feb 2024] |
| - Graduation Projects Documentation Committee | [Aug 2023 | – | Jul 2023] |
| - Faculty Online Platform Review Committee | [Aug 2022 | – | Sep 2022] |
| - Bylaw Amendment Committee | [Apr 2022 | – | Sep 2022] |

• **Meamar Elhamd for Real Estate Development, New Damietta 34517, Egypt**

Job: Technical Office Engineer (Sep 2019 – Sep 2020)

| 1 year of experience

• **Key responsibilities**

- Prepared and reviewed shop drawings, as-built drawings, and coordination plans for residential and commercial projects.
- Performed quantity surveying, prepared BOQs, and assisted in cost estimates and variation orders.
- Coordinated with site engineers, subcontractors, and suppliers to resolve technical issues and ensure design compliance.
- Prepared technical submittals, RFIs, and documentation required for consultants and project owners.
- Assisted in project planning and scheduling, tracking work progress against the approved baseline program.
- Monitored material usage and construction progress to support cost control and adherence to project specifications.

Academic Courses Certificates

- **Coursera:** What is Data Science? (2025)
- **Scopus Academy:** Basic Search (2025), Advanced Search (2025), Metrics (2025), Research Collaborations (2025)
- **Library Connect Academy:** Benefits & Risks of AI (2025), Foundations of AI (2025), Responsible AI (2025)
- **Wiley:** Top Cited Paper in Irrigation & Drainage Journal (2025)
- **Horus University-Egypt:** The Academic Landscape in the Era of AI (2024); MSc Degree Completion (2024)
- **41st National Radio Science Conference (NRSC):** Local Organizing Committee Member (2024)
- **Applied Innovative Research in Grand Engineering Challenges (AIRGEC):** Local Organizing Committee Member and Author (2024)
- **DAAD Kairo Akademie:** Proposal Writing for Master & PhD Candidates (2023)
- **Electronic Courses Platform, Port Said University**
 - Effective Presentation Skills (2023)
 - International Publishing of Scientific Research (2023)
 - Using Technology in Teaching (2023)
 - Change Management Skills (2023)
 - Comprehensive Quality Standards in Health Institutions (2023)
 - Credit Hours System (2023)
- **Centre of Knowledge and e-Services:** Fundamentals of Digital Transformation Certificate (FDTC, 2020)
- **Cisco Networking Academy:** Entrepreneurship course (2020)
- **Damietta University:** Teaching Experience Certificate (2018)

Engineering Courses Certificates

- ♦ **Arab Co. for Engineering & Systems Consultations:** Internal Revision based on ISO 9001/2015 & 21000/2018 Regulations (2024)
- ♦ **Meamar Elhamd for Real Estate Development:** Technical Office Engineer & Structural Designer (2020)
- ♦ **iLearn Academy:** Structural Design Diploma (2019)
- ♦ **Orascom EgyNile:** Primavera & Revit Diploma (2018)
- ♦ **Port-Said Engineering Syndicate:** Site Engineer (2018)
- ♦ **Egyptian Engineers Syndicate:** Certificate of Academic Excellence in Civil Engineering (2018)
- ♦ **Jelecom-Egypt:** AutoCAD 2D Basic Applications (2015)

Skills

- ♦ **Personal:** Attention to detail, Problem solving, Teamwork, Organization, Working Under Pressure
- ♦ **Programming:** MATLAB, Python
- ♦ **Drawing & Drafting:** AutoCAD, SketchUp, Revit Structural, Origin
- ♦ **Structural Analysis & Design:** ETABS, SAFE, SAP
- ♦ **Documentation & Reporting:** MS Word, MS Excel, MS PowerPoint
- ♦ **Hydraulic Modeling:** FLOW3D, Flow Master, SEEP/W & SLOPE/W (GeoStudio), SLIDE (Rocscience)

Languages

- ♦ **Arabic** (Native Language)
- ♦ **English** [IELTS (6.0) & TOEFL ITP (510)]

Journal Roles

- ♦ **Handling Editor:** Frontiers in Built Environment Journal
- ♦ **Peer Reviewer in (41) distinct journals** (89 articles)

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| Agricultural Water Management (12) | Innovative Infrastructure Solutions (1) | Modeling Earth Sys. and Environment (3) |
| Arabian Journal of Geosciences (1) | Int. J. Concrete Structures and Materials (1) | Neural Computing and Applications (1) |
| Case Studies in Construction Materials (2) | Int. J. Pavement Research and Techn. (1) | Operations Research Forum (2) |
| Discover Artificial Intelligence (1) | Int. J. Digital Earth (1) | Physics and Chemistry of the Earth (2) |
| Discover Civil Engineering (1) | Iranian J. Sci. Techn., Trans. of Civil Eng. (1) | Results in Engineering (6) |
| Discover Water (1) | Irrigation and Drainage (1) | Science of the Total Environment (2) |
| Earth Science Informatics (2) | Journal of African Earth Sciences (1) | Scientific Reports (8) |
| Earth Systems and Environment (1) | Journal of Asian Arch. and Build. Eng. (1) | Stoch. Environ. Res. Risk Assessment (1) |
| Eng. Applications of AI (3) | Journal of Ecohydraulics (1) | Structures (2) |
| Environ, Develop. Sustain. (1) | Journal of Environmental Management (1) | Sustainable Water Resources Manag. (4) |
| Euro-Mediterranean J for Environ. Integ. (2) | Journal of Hydrology (1) | Urban Water Journal (1) |
| Flow Measurement and Instrumentation (1) | Journal of Water Process Engineering (9) | Water Cons. Science and Engineering (1) |
| Geomatics, Natural Hazards & Risk (1) | Knowledge-based Systems (2) | Water Resources Management (1) |
| Hydrogeology Journal (1) | Mathematical and Comput. Apps. (1) | |

Research Articles (Extracted from M.Sc. Thesis)

- [1] **Elshaarawy, M. K.** (2025). Numerical and Regression-Based Modeling of Leakage in Lined Trapezoidal Channels. *Horus University Journal of Engineering*, 1(1), 1-12. <https://doi.org/10.21608/huje.2025.366458.1001>.
- [2] **Elshaarawy, M. K.** (2025). Metaheuristic-driven CatBoost model for accurate seepage loss prediction in lined canals. *Multiscale and Multidisciplinary Modeling, Experiments and Design*, 8(5), 235. <https://doi.org/10.1007/s41939-025-00800-8>.
- [3] **Elshaarawy, M. K.** (2025). Stacked-based hybrid gradient boosting models for estimating seepage from lined canals. *Journal of Water Process Engineering*, 70, 106913. <https://doi.org/10.1016/j.jwpe.2024.106913>.
- [4] **Elshaarawy, M. K., & Elmasry, N. H.** (2024). Experimental and Numerical Modeling of Seepage in Trapezoidal Channels. *Knowledge-Based Engineering and Sciences*, 5(3), 43-60. <https://doi.org/10.51526/kbes.2024.5.3.43-60>.
- [5] **Elshaarawy, M. K., Elmasry, N. H., Selim, T., Elkiki, M., & Eltarabily, M. G.** (2024). Determining seepage loss predictions in

- lined canals through optimizing advanced gradient boosting techniques. *Water Conservation Science and Engineering*, 9(2), 75. <https://doi.org/10.1007/s41101-024-00306-3>.
- [6] Selim, T., **Elshaarawy, M. K.**, Elkiki, M., & Eltarabily, M. G. (2024). Estimating seepage losses from lined irrigation canals using nonlinear regression and artificial neural network models. *Applied Water Science*, 14(5), 90. <https://doi.org/10.1007/s13201-024-02142-1>.
- [7] Eltarabily, M. G., **Elshaarawy, M. K.**, Elkiki, M., & Selim, T. (2024). Computational fluid dynamics and artificial neural networks for modelling lined irrigation canals with low-density polyethylene and cement concrete liners. *Irrigation and Drainage*, 73(3), 910-927. <https://doi.org/10.1002/ird.2911>.
- [8] Eltarabily, M. G., Abd-Elhamid, H. F., Zelenáková, M., **Elshaarawy, M. K.**, Elkiki, M., & Selim, T. (2023). Predicting seepage losses from lined irrigation canals using machine learning models. *Frontiers in Water*, 5, 1287357. <https://doi.org/10.3389/frwa.2023.1287357>.
- [9] Eltarabily, M. G., **Elshaarawy, M. K.**, Elkiki, M., & Selim, T. (2023). Modeling surface water and groundwater interactions for seepage losses estimation from unlined and lined canals. *Water Science*, 37(1), 315-328. <https://doi.org/10.1080/23570008.2023.2248734>.

Research Articles (Water Resources & Hydraulic Engineering)

- [10] Elmasry, N.H. & **Elshaarawy, M.K.** (2025). Interpretable Stacked Gradient-Boosting Models for Predicting the Discharge Coefficient of Elliptical Side Orifices. *Journal of Hydrology and Hydromechanics*, 73(4), 2025. 378-395. <https://doi.org/10.2478/johh-2025-0029>.
- [11] **Elshaarawy, M. K.**, & Armanuos, A. M. (2025). Simulating the effectiveness of artificial recharge and cutoff walls for saltwater intrusion control with explainable ML and GUI deployment. *Catena*, 261, 109558. <https://doi.org/10.1016/j.catena.2025.109558>.
- [12] Eltarabily, M. G., **Elshaarawy, M. K.**, Bali, K. M., & Gabr, M. E. (2025). Predicting reference evapotranspiration in semi-arid regions using optimized machine learning models. *Journal of Water and Climate Change*, 16(10), 3082-3108. <https://doi.org/10.2166/wcc.2025.853>.
- [13] Hamed, A. K., & **Elshaarawy, M. K.** (2025). Hybrid data-driven machine learning approach for forecasting discharge coefficient of Piano Key Weirs. *Flow Measurement and Instrumentation*, 103050. <https://doi.org/10.1016/j.flowmeasinst.2025.103050>.
- [14] Armanuos, A. M., Zelenáková, M., & **Elshaarawy, M. K.** (2025). Explainable ML modeling of saltwater intrusion control with underground barriers in coastal sloping aquifers. *Scientific Reports*, 15(1), 29281. <https://doi.org/10.1038/s41598-025-12830-w>.
- [15] **Elshaarawy, M. K.**, Zelenáková, M., & Armanuos, A. M. (2025). Hydraulic performance modeling of inclined double cutoff walls beneath hydraulic structures using optimized ensemble machine learning. *Scientific Reports*, 15(1), 27592. <https://doi.org/10.1038/s41598-025-10990-3>.
- [16] Elazab, M. A., Elgohr, A. T., Bassyouni, M., Kabeel, A. E., Attia, M. E. H., **Elshaarawy, M. K.**, Hamed, A. K., & Alzahrani, H. A. (2025). Green Hydrogen: Unleashing the Potential for Sustainable Energy Generation. *Results in Engineering*, 106031. <https://doi.org/10.1016/j.rineng.2025.106031>.
- [17] Kabeel, A. E., Elazab, M. A., Diab, M. R., El-Said, E. M., Attia, M. E. H., & **Elshaarawy, M. K.** (2025). Hybrid humidification-dehumidification with renewable energy integration for enhanced desalination: An overview. *Renewable and Sustainable Energy Reviews*, 211, 115313. <https://doi.org/10.1016/j.rser.2024.115313>.
- [18] Armanuos, A. M., & **Elshaarawy, M. K.** (2025). Estimating saltwater wedge length in sloping coastal aquifers using explainable machine learning models. *Earth Science Informatics*, 18(2), 405. <https://doi.org/10.1007/s12145-025-01900-2>.
- [19] Hamed, A. K., & **Elshaarawy, M. K.** (2025). Soft Computing Approaches for Forecasting Discharge over Symmetrical Piano Key Weirs. *AI in Civil Engineering*. <https://doi.org/10.1007/s43503-024-00048-0>.
- [20] **Elshaarawy, M. K.**, & Hamed, A. K. (2025). Modeling hydraulic jump roller length on rough beds: a comparative study of ANN and GEP models. *Journal of Umm Al-Qura University for Engineering and Architecture*, 1-23. <https://doi.org/10.1007/s43995-024-00093-x>.
- [21] **Elshaarawy, M. K.**, & Armanuos, A. M. (2025). Predicting Seawater Intrusion Wedge Length in Coastal Aquifers Using Hybrid Gradient Boosting Techniques. *Earth Science Informatics*. <https://doi.org/10.1007/s12145-025-01755-7>.
- [22] **Elshaarawy, M. K.**, & Hamed, A. K. (2024). Machine learning and interactive GUI for estimating roller length of hydraulic jumps. *Neural Computing and Applications*, 1-30. <https://doi.org/10.1007/s00521-024-10846-3>.
- [23] **Elshaarawy, M. K.**, & Hamed, A. K. (2024). Stacked ensemble model for optimized prediction of triangular side orifice discharge coefficient. *Engineering Optimization*, 1-31. <https://doi.org/10.1080/0305215X.2024.2397431>.

- [24] Tian, W., Isleem, H. F., Hamed, A. K., & **Elshaarawy, M. K.** (2024). Enhancing discharge prediction over Type-A piano key weirs: An innovative machine learning approach. *Flow Measurement and Instrumentation*, 100, 102732. <https://doi.org/10.1016/j.flowmeasinst.2024.102732>.
- [25] **Elshaarawy, M. K.**, & Eltarabily, M. G. (2024). Machine learning models for predicting water quality index: optimization and performance analysis for El Moghra, Egypt. *Water Supply*, 24(9), 3269-3294. <https://doi.org/10.2166/ws.2024.189>.
- [26] Elazab, M. A., Attia, M. E. H., **Elshaarawy, M. K.**, Hamed, A. K., Alsaadawi, M. M., Elnasr, M. A., & Bady, M. (2024). Exploring the potential of conical solar stills: Design optimization and enhanced performance overview. *Desalination and Water Treatment*, 320, 100642. <https://doi.org/10.1016/j.dwt.2024.100642>.
- [27] **Elshaarawy, M. K.**, & Hamed, A. K. (2024). Predicting discharge coefficient of triangular side orifice using ANN and GEP models. *Water Science*, 38(1), 1-20. <https://doi.org/10.1080/23570008.2023.2290301>.
- [28] Eltarabily, M. G., Selim, T., **Elshaarawy, M. K.**, & Mourad, M. H. (2024). Numerical and experimental modeling of geotextile soil reinforcement for optimizing settlement and stability of loaded slopes of irrigation canals. *Environmental Earth Sciences*, 83(8), 246. <https://doi.org/10.1007/s12665-024-11560-y>.
- [29] **Elshaarawy, M.**, Hamed, A. K., & Hamed, S. (2023). Regression-based models for predicting discharge coefficient of triangular side orifice. *Journal of Engineering Research*, 7(5), 224-231. <https://doi.org/digitalcommons.aaru.edu.jo/erjeng/vol7/iss5/31>.

Research Articles (Structural Engineering)

- [30] Alsaadawi, M. M., **Elshaarawy, M. K.**, & Hamed, A. K. (2025). Concrete compressive strength classification using hybrid machine learning models and interactive GUI. *Innovative Infrastructure Solutions*, 10(5), 1-29. <https://doi.org/10.1007/s41062-025-01983-2>.
- [31] Yu, F., Isleem, H. F., Almoghayer, W. J., Shahin, R. I., Yehia, S. A., Khishe, M., & **Elshaarawy, M. K.** (2025). Predicting axial load capacity in elliptical fiber reinforced polymer concrete steel double skin columns using machine learning. *Scientific Reports*, 15(1), 12899. <https://doi.org/10.1038/s41598-025-97258-y>.
- [32] Zhang J., Almoghayer, W.J.K., Isleem, H.F., Jangir P., Arpita, Tejani, G.G., Negi, B.S., & **Elshaarawy, M.K.** (2025). Machine learning for the prediction of the axial load-carrying capacity of FRP reinforced hollow concrete column. *Structural Concrete*. <https://doi.org/10.1002/suco.202400886>.
- [33] **Elshaarawy, M. K.**, Hamed, A. K., & Alsaadawi, M. M. (2025). Hybrid gradient boosting models for concrete compressive strength classification and prediction. *International Journal of Machine Learning and Cybernetics*, 1-35. <https://doi.org/10.1007/s13042-025-02776-w>.
- [34] Elmasry, N. H., & **Elshaarawy, M. K.** (2025). Hybrid metaheuristic optimized Catboost models for construction cost estimation of concrete solid slabs. *Scientific Reports*, 15(1), 21612. <https://doi.org/10.1038/s41598-025-06380-4>.
- [35] Shen, F., Jha, I., Isleem, H. F., Almoghayer, W. J. K., Khishe, M., & **Elshaarawy, M. K.** (2025). Advanced predictive machine and deep learning models for round-ended CFST column. *Scientific Reports*, 15, 6194. <https://doi.org/10.1038/s41598-025-90648-2>.
- [36] Hamed, A. K., **Elshaarawy, M. K.**, & Alsaadawi, M. M. (2025). Stacked-based machine learning to predict the uniaxial compressive strength of concrete materials. *Computers & Structures*, 308, 107644. <https://doi.org/10.1016/j.compstruc.2025.107644>.
- [37] Isleem, H. F., Qiong, T., Alsaadawi, M. M., **Elshaarawy, M. K.**, Mansour, D. M., Abdullah, F., Mandor, A., Sor, N. H., & Jahami, A. (2024). Numerical and machine learning modeling of GFRP confined concrete-steel hollow elliptical columns. *Scientific Reports*, 14(1), 18647. <https://doi.org/10.1038/s41598-024-68360-4>.
- [38] **Elshaarawy, M. K.**, Alsaadawi, M. M., & Hamed, A. K. (2024). Machine learning and interactive GUI for concrete compressive strength prediction. *Scientific Reports*, 14(1), 16694. <https://doi.org/10.1038/s41598-024-66957-3>.

Book Chapters and Theses

- [39] **Elshaarawy, M. K.**, Elkiki, M., Selim, T., & Eltarabily, M. G. (2024). Hydraulic comparison of different types of lining for irrigation canals using computational fluid dynamic models. *M.Sc. Thesis, Civil Engineering Department, Faculty of Engineering, Port Said University*. <http://dx.doi.org/10.13140/RG.2.2.21927.97441>
- [40] Isleem, H. F., **Elshaarawy, M. K.**, & Hamed, A. K. (2024). Analysis of flow dynamics and energy dissipation in piano key and labyrinth weirs using computational fluid dynamics. In: *Computational Fluid Dynamics - Analysis, Simulations, and Applications*, *IntechOpen*. <https://doi.org/10.5772/intechopen.1006332>.
- [41] Eltarabily, M. G., & **Elshaarawy, M. K.** (2023). Risk Assessment of Potential Groundwater Contamination by Agricultural Drainage Water in the Central Valley Watershed, California, USA. In *Groundwater Quality and Geochemistry in Arid and Semi-Arid Regions* (pp. 37-76). Cham: Springer Nature Switzerland. https://doi.org/10.1007/698_2023_1051.

References

◆ **Prof. Ibrahim Mohamed Hussein Rashwan**

Affiliation: Irrigation & Hydraulics Engineering Department, Faculty of Engineering, Tanta University, Tanta, Egypt.

Email: ibrahim.rashwan@f-eng.tanta.edu.eg | **Mobile:** +20 12 2657 3674

◆ **Assoc. Prof. Asaad Mater Armanuos**

Affiliation: Irrigation & Hydraulics Engineering Department, Faculty of Engineering, Tanta University, Tanta, Egypt.

Email: asaad.matter@f-eng.tanta.edu.eg | **Mobile:** +20 12 7876 7288

◆ **Assoc. Prof. Mohamed Galal Eltarabily**

Affiliation: Civil Engineering Department, Faculty of Engineering, Port Said University, Port Said, Egypt.

Email: eng_m_trabily@eng.psu.edu.eg | **Mobile:** +20 12 2259 2623

◆ **Dr. Ahmed Ali Elsharkawy**

Affiliation: Civil Engineering Department, Faculty of Engineering, Port Said University, Port Said, Egypt.

Email: aelsarkawy@horus.edu.eg | **Mobile:** +20 11 5654 1111

All documents are available upon reasonable request