

# OMAR AHMED MOHAMED GOMAA ALI

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## Field of Specialization

- Geophysical engineering studies
- Application of Geophysics in Archaeological studies
- Environmental geophysics studies
- Groundwater investigation studies
- Geotechnical & environmental engineering studies
- Applied geophysics & Theoretical studies of potential field

## Education

- 15 July 2023 – 20 October 2025 **PhD degree in Geophysics - Cairo University**  
Title of the thesis “Developing new optimization algorithms by applying different geophysical datasets for modeling and evaluation subsurface reservoirs”.
- 10 October 2020 - 01 June 2023 **Master degree in Geophysics - Cairo University**  
Title of the thesis “Application of Potential Field Data in Natural Resources Development: Theory and Case Studies”.
- 21 September 2013 - 30 May 2017 **Bachelor of science degree in Geophysics - Cairo University**

## Employment Experiences

- Head of the Information System and Knowledge Documentation Unit, Cairo University Center for Quality Assurance of Education (Dec 2025-present).
- Lecturer in the geophysics department, Cairo University (Nov 2025-Present).
- Lecturer assistant in the geophysics department, Cairo University (2023-2025).
- Demonstrator in the geophysics department, Cairo University (2019-2023).
- Recorder observer assistant, Geofizyka Torun (2018-2019).
- QC inspector (Junior client representative), Apache (2017-2018).

## Publications

- Essa, K.S., Diab, Z.E., Gomaa, O.A. et al. Enhanced self-potential inversion using a hybrid Second Horizontal Gradient and Bat Algorithm–SHGBA-framework for geothermal reservoir characterization. *Sci Rep* 15, 40407 (2025). <https://doi.org/10.1038/s41598-025-17101-2>
- Essa, K.S., Elhussein, M., Gomaa, O.A. et al. Reliable and efficient magnetic data inversion for resource detection using a hybrid bat algorithm. *Sci Rep* 15, 27187 (2025). <https://doi.org/10.1038/s41598-025-10138-3>
- Essa, K.S., Gomaa, O.A., Elhussein, M. et al. A prosperous and thorough analysis of gravity profiles for resources exploration utilizing the metaheuristic Bat Algorithm. *Sci Rep* 15, 5000 (2025). <https://doi.org/10.1038/s41598-025-88350-4>
- Essa, K.S., Abo-Ezz, E.R. et al. Magnetic inversion approach for modeling data acquired across faults: various environmental cases studies. *Acta Geophys.* 72, 1819–1845 (2024). <https://doi.org/10.1007/s11600-023-01184-4>
- Elhussein, M., Abo-Ezz, E.R., Gomaa, O.A. et al. Two-sided fault parameter assessment through the utilization of a particle swarm optimizer to different gravity horizontal gradients-orders with application to various cases studies. *Environ Earth Sci* 82, 502 (2023). <https://doi.org/10.1007/s12665-023-11081-0>
- Essa, K., Elhussein, M., & Gomaa, O. (2022). Fast Inversion Approach for Modeling Gravity Data: Varying Synthetic and Real Cases. *Journal of Applied Geophysics (Cairo)*, 21(1), 20-44. <https://doi.org/10.21608/jag.2022.291608>

## Software Skills

- Microsoft Office, Surfer, MATLAB, Fortran, QBasic & Geosoft Oasis Monaj.

## Languages

- **English:** Excellent command (both written and spoken)
- **Arabic:** Native language