Ahmed Aly

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Operations Research Scientist with experience in mathematical modeling, statistical analysis, and building large-scale optimization models. Proven ability to translate complex business challenges in the energy and infrastructure sectors into data-driven solutions, with expertise in time-series forecasting, simulation, and anomaly detection

WORK EXPERIENCE

Research Assistant | Khalifa University | January 2025 - Present | Abu Dhabi, UAE

- Partnered with DEWA to develop simulation and optimization models to forecast power supply and demand and optimize resource allocation for large-scale energy assets (renewables, storage).
- Engineered predictive models for power asset operations, incorporating minute-level time-series data to analyze asset performance and non-linear efficiency curves.
- Built a modular Python optimization library (Pytest, Sphinx) with an interactive Streamlit/Plotly UI to support data-driven decision-making for technical stakeholders.
- Developed renewables, and chiller simulations (pvlib, oemof, EnergyPlus) to generate realistic time-series data.
- Formulated and validated levelized cost metrics to trace energy costs from supply to demand, enabling data-driven risk assessment for current and new infrastructure projects.

Undergraduate Researcher | Khalifa University | December 2021 – November 2024 | Abu Dhabi, UAE

- Developed a stochastic VNS algorithm to solve the Delivery Territory Design problem to handle real-world variability and constraints.
- Created a new benchmark dataset enabling rigorous testing and comparison of algorithms
- Presented results at VNS 2022 and published in *Lecture Notes in Computer Science (2023)*.
- Ran sensitivity analyses and large-scale experiments; published in *Computers & Operations Research (2024)*.

Operations Research Scientist | AHOY DMCC | May 2022 – March 2023 | Dubai, UAE

- Led a cross-functional team as product manager for a flagship routing product, translating business needs into technical specifications and data models.
- Developed and deployed AI algorithms (metaheuristics: GRASP, Tabu Search, VNS) in Python to solve large-scale clustering and facility location problems.
- Engineered real-time data processing pipelines for streaming traffic and weather data to improve routing decisions and government policy adherence.
- Deployed and managed models as services (FastAPI) using Docker and Azure DevOps for cloud-based deployment.

EDUCATION

MSc. Data Science (Statistics) (Part-time) | University of Leeds | Exp. January 2027 | England, UK
BSc. Applied Mathematics and Statistics | Khalifa University | August 2021 | Abu Dhabi, UAE
Certifications (In Progress) |Microsoft Azure Data Scientist (DP-100)

PUBLICATIONS & CONFERENCES

Aly, A., Gabor, A. F., & Mladenović, N. (2023). An effective VNS for delivery districting. In Lecture Notes in Computer Science (pp. 69–81). https://doi.org/10.1007/978-3-031-34500-5_6

Aly, A., Gabor, A. F., & Mladenović, N., Sleptchenko A. (2024) An efficient stochastic VNS for delivery territory design. In Computers & Operations Research. https://doi.org/10.1016/j.cor.2024.106756

Aly, A., Gabor, A. F., Mladenovic, N. (2022, October 25-28). An effective VNS for delivery districting International Conference of Variable Neighborhood Search: Abu Dhabi, United Arab Emirates

SKILLS & CERTIFICATIONS

- **Skills | Methodologies:** Optimization, Machine Learning, Prescriptive Analytics, Anomaly Detection, Time-Series Forecasting, Mathematical Modeling, Algorithm Design, Metaheuristics, Simulations
- **Tools:** Python, Gurobi, Pyomo, R, SQL, NoSQL, Docker, APIs, Azure DevOps, AnyLogic
- **Certifications:** Yellow Belt Six Sigma