Mustafa Abdel-Rahman Alnagdy

Senior 2 Petrochemical Processing Systems Engineering student

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Summary

Aspiring Data Scientist and senior Petrochemical Process Systems Engineering student with strong capabilities in machine learning, process modeling, and data-driven engineering solutions. Experienced in Python, data analytics, and visualization, with hands-on work in process data integration, anomaly detection, simulation workflows, and AI-powered automation. Currently completing a Data Science Professional Certificate (DataCamp) to advance expertise in ML, statistical modeling, and scalable data pipelines. Passionate about applying advanced analytics and AI to optimize industrial processes and drive innovation in both engineering and business environments.

Education

2021- Jun 2026 **Senior 2, Cairo University, faculty of Engineering Credit Hours System (CHS)**

program of Petrochemical Processing Systems Engineering (PPS)

Cumulative GPA 3.63

2018-2021 **General Secondary Education Certificate**

Internships

Data Science & AI Intern – **MIS** | Aug 2025 - Now

- Developing **AI agents** and **Retrieval-Augmented Generation (RAG) agents** using n8n automation and python.
- Performing **data preprocessing, cleaning, and visualization** in Python using Jupyter Notebook.
- Building automated workflows for integrating and analyzing structured and unstructured datasets.
- Making Machine Learning Models for predicting

Social Media Intern – **Waste Marche** | Jun 2025 – Jul 2025

- Created **LinkedIn carousel posts** on sustainability, carbon footprint, waste management, and industrial training programs.
- Applied **data-driven content strategy** to increase engagement and reach.

Process Engineer Intern – **ENPPI** | Jul 2024

- Gained in-depth knowledge of **towers, heat exchangers**, and process safety protocols.
- Learned industry best practices for safe and efficient process operations.

Process Engineer Intern – **Onspec** | Aug 2024

- Conducted **unsteady-state process simulation** in Aspen HYSYS.

- Studied different **pump types, components, and performance calculations**.

Process Engineer Intern – **Petrojet** | Jul 2023 – Aug 2023

- Designed and interpreted **BFD, PFD, and P&ID** diagrams using AutoCAD.
- Collaborated on process data handling and documentation for engineering projects.

Process Engineer Intern – **Onspec** | Aug 2023 – Sep 2023

- Analyzed **System Flow Diagrams (SFD)** and utilities flow diagrams.
- Learned steady-state simulation techniques in Aspen HYSYS.

Skills

Programming: Python, HTML/CSS

Data Science & Analytics: Pandas, NumPy, Scikit-learn, Data Cleaning, Feature Engineering, Data Visualization (Matplotlib, Seaborn), Statistical Analysis

Machine Learning: Regression, Classification, Clustering, Model Evaluation

Big Data & Cloud Concepts: Data Integration from Multiple Sources, AI Agent & RAG Agent Development, Basic Cloud Computing Principles

Process Engineering Tools: Aspen HYSYS (steady state) ,Process Flow Diagrams (PFD), Piping & Instrumentation Diagrams (P&ID)

Other Tools: Microsoft tools, n8n Automation

Soft Skills: Analytical thinking, Problem-solving, Communication, Team Collaboration

Projects & Academic Work

Chemical Process ML Model: Built a predictive Python model to optimize reaction yield using regression algorithms and preprocessing techniques.

Anomaly Detection in Multiphase Flow Facility (Machine Learning Project): Developed an ML-based anomaly detection system for a multiphase air–water flow facility using 29 sensor variables, performing data cleaning, feature engineering, and model comparison to identify normal vs abnormal operation and classify two fault types (air leakage and air blockage), improving detection accuracy and demonstrating strong integration of chemical engineering process understanding with machine learning.

Predicting Gas Estimated Ultimate Recovery (EUR) Using Machine Learning: Built a regression model to predict gas EUR for 507 simulated horizontal multistage fractured wells using geological, drilling, and completion attributes; performed data preprocessing, feature engineering, and model evaluation to achieve high correlation with actual EUR values, while analyzing feature importance to identify the most influential well parameters for reservoir performance forecasting.

Predicting Electrical Load Categories in Steel Production (DAEWOO Steel, South Korea) Using Machine Learning: Developed a multi-class classification model to predict electricity load levels (Light, Medium, Maximum) for 35k+ steel production cycles using historical consumption data, KEPCO industry data, time-based features, grid measurements, and power factor indicators; performed feature engineering on timestamp variables, reactive power metrics, and usage patterns to improve predictive accuracy, enabling optimized production scheduling, energy-saving strategies, and better load management for industrial operations.

Course And Workshops

Data Science Professional Certificate – DataCamp *(In Progress)*

Circular Economy – Cairo University (Feb 2024)

Process Safety – ENPPI (Sep 2023)

Web Development – Udacity (Sep 2022)

Language

Arabic: Native

English: Professional Proficiency

Interests

Data-driven problem solving, Coding and connecting Machine Learning with Process Engineering