

Sayed Salem

Machine Learning Engineer

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🎓 EDUCATION

Bachelor Degree in Computer Engineering, Tanta University
Cumulative GPA : 3.6/4.0

09/2020 – 2025
Egypt, Tanta

🏢 EXPERIENCE

Trainee, National Telecommunication Institute (NTI) AI Track

08/2024 – 09/2024

- Experienced with **sequential (time series)** and **non-sequential** datasets
- Skilled in **normalization, classification, ensemble learning, cross-validation**
- Proficient in **hyperparameter tuning, regularization, and regression analysis**
- Familiar with **encoding non-numeric data, handling NaN values, duplicates, and outliers**
- Strong foundation in deep learning (FCNN, CNNs, RNNs, LSTM), **gradient descent**, and **loss functions**, and **optimizers** such as **Gradient Descent** and **Adam**
- Knowledgeable in **activation functions, dropout, augmentation, early stopping**
- Strong **communication skills**, able to convey technical concepts to non-technical audiences
- Skilled in **interview and presentation techniques** for impactful professional communication.

Trainee, AWS AI & ML Scholarship

10/2023 – 06/2024

- Proficient in **Python programming, Object-Oriented Programming (OOP)**, and **NumPy** Library.
- Experienced in visualizing datasets using **Matplotlib** and **Seaborn**.
- Developed an **AutoML** model with **AutoGluon** to predict hourly bike rentals.
- Gained comprehensive knowledge of **Neural Networks**, including **training processes, backpropagation**, and **gradient descent**.
- Acquired expertise in **Convolutional Neural Networks (CNNs)**, including **filters, Global Average Pooling (GAP) layers**, and **image augmentation** through transformations.
- Learned about **autoencoders**, including **linear autoencoders, CNN autoencoders, denoising autoencoders**, and **generative models**.
- Studied **object detection and localization**, specifically one-stage detection with **RetinaNet** and related **metrics**.
- Gained knowledge in **image segmentation** techniques like **semantic segmentation**.
- Experienced in **AWS SageMaker essentials**, including **training jobs, endpoints, batch transforms**, and **processing jobs**.
- Proficient in **AWS workflows**, including **Lambda functions, Step Functions, SageMaker Pipelines, SageMaker Model Monitor**, and **SageMaker Clarify**.

📁 PROJECTS

mini-RAG, Question Answering with Retrieval-Augmented Generation 📄

- Developed a **FastAPI-based application** for question answering using the RAG (Retrieval-Augmented Generation) model.
- Designed and implemented **7 FastAPI endpoints** for file uploads, processing, vector database interactions, and RAG-based query answering.
- Built a **custom LLM Factory** to support multiple providers (OpenAI, Cohere, Google) and a **VectorDB Factory** for extensible vector database integration (e.g., **Qdrant**).
- Implemented **local LLM support** using Ollama, enabling model usage via Google Colab without local downloads.
- Migrated the database layer from **MongoDB** to **PostgreSQL** using **SQLAlchemy** and **Alembic**, automating schema management and improving scalability.
- Achieved **two production-ready releases**: one with MongoDB and another with PostgreSQL, showcasing adaptability across database backends.
- Optimized performance with **MongoDB indexing** and **asynchronous programming** for efficient file processing and database interactions.

Landmark Classification & Tagging for Social Media 📄

- Developed a **CNN-based application** to predict image locations by detecting landmarks
- Implemented **data augmentation**, custom CNN architecture inspired by **ResNet** and **VGG**, and effective optimization strategies
- Built a CNN from scratch, achieving over **50% accuracy**
- Employed **transfer learning** with pretrained **ResNet18**, achieving over **60% accuracy**

AWS Scones Unlimited - Vehicle Image Classification 📄

- Developed an AWS-based application to classify delivery vehicles (bicycles vs. motorcycles), optimizing routing operations
- Employed **SageMaker** for model training, data capture, and endpoint deployment
- Implemented custom hyperparameters and trained a CNN-based classifier, achieving **84% accuracy** over 30 epochs
- Utilized **Lambda Functions** and **Step Functions** for automated, scalable image processing and classification workflow
- Built and tested a complete solution with real-time inference, enabling seamless delivery decisions

Predict Bike Sharing Demand with AutoGluon 📄

- Developed a predictive model to forecast bike rentals per hour using the AutoGluon library
- Leveraged AutoGluon's automated machine learning capabilities to train multiple models on the dataset
- Enhanced model performance by tuning hyperparameters and optimizing configurations, leading to improved prediction accuracy

🧠 SKILLS

C++ | Python | Data Structures | Algorithms | OOP | Competitive Programming | Problem Solving | NumPy | Pandas | Seaborn | Data Manipulation | Feature Engineering | Data Cleaning | Machine Learning Algorithms | XGBoost | Scikit-learn | Supervised Learning | Classification | Regression | Unsupervised Learning | Clustering | AutoGluon | Reinforcement Learning | Deep Learning | Pytorch | TensorFlow | Keras | ANN | CNN | Git | Github | SQL | Langchain | RAG | NLP | Chatbot | HuggingFace | Prompt Engineering | LLM Finetuning | AWS | Cloud Services | FastAPI | Flask | MongoDB | PostgreSQL | SQLAlchemy | Alembic | Qdrant | Ollama | Leadership

🏆 AWARDS

Egyptian Collegiate Programming Competition (ECPC)
Participated in ECPC in 2022, 2023, and 2024; achieved **3rd place** from my university and qualified for the **ECPC Finalist** in 2024.
Achieved a high rank in **Codeforces**, attaining the title of **Specialist** by solving approximately **1000** problems
Achieved **Kaggle Notebook Expert** status with more than **6 bronze medals**, demonstrating expertise in **data analysis, machine learning**.

🏠 LEADERSHIP

Problem-Solving Mentor , Problem Setter, ICPC Tanta Community 09/2023 – present
Worked with the team to gather materials and problems for relevant topics, led upsolving sessions, and organized practice rounds.

📖 COURSES

Build Chat Applications with OpenAI and LangChain, 365 Data Science 11/2024
Machine Learning Specialization, Coursera 03/2024
Programming with C++, Tanta University
Data Structure and Algorithms, Tanta University
Machine Learning, Tanta University
Deep Learning ANN and GANs, Tanta University
Database System, Tanta University