

Yahia Salaheldin Shaaban

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EDUCATION

- **Mohamed bin Zayed University of Artificial Intelligence (MBZUAI)** Abu Dhabi, UAE
MSc in Machine Learning Aug. 2024 – May 2026
 - **Research Interests:** I am working the supervision of Dr. Salem Lahlou and Dr. Martin Takac on the intersection between Reinforcement learning and Natural Language processing for reasoning in LLMs.
- **Faculty of Engineering, Alexandria University** Alexandria, Egypt
MSc in Computer Science; GPA: 4.0 Feb. 2024 – Jul. 2024
 - **Semester Project:** Developed a multi-granular text retrieval model for the Arabic language, supervised by Dr. Nagwa ELMakky and Dr. Marwan Torki.
 - **Courses Completed:** Simulation Techniques, Natural Language Processing, Reinforcement Learning.
- **Faculty of Engineering, Alexandria University** Alexandria, Egypt
BSc in Computer and Communication Engineering; Graduated in the top 5% Sept. 2018 – Jul. 2023
 - **Thesis:** Designed a personalization scheme for federated learning for neural collaborative filtering. Developed secure multi-party computation (SMPC) aggregation and integrated it into the Flower library. Supervised by Dr. Ahmed Kosba
 - **Courses Completed:** Algorithms and Data Structures, Operating Systems, Databases, Networks, Distributed Systems.

EXPERIENCE

- **AIC-MCIT** Alexandria, Egypt
R&D Junior Engineer Sept. 2023 - Aug. 2024
 - **Remote Sensing:** Developed a multi-spectral model for crop field segmentation. Built an internal multi-source satellite dataset benchmark, including Planet Labs and Landsat data. Supervised the annotation pipeline and implemented human-in-the-loop techniques to enhance model performance.
 - **Biomedical Imaging:** Developed a data pipeline for DICOM images and a production-level segmentation model for breast cancer screening for Baheya hospital.
 - **Model Optimization and Deployment:** Optimized deep learning models using pruning and quantization. Deployed models on-premise and utilized Ray on top of Slurm, Docker, and TorchServe.
- **Flower Labs** Remote - Cambridge University
Flower Summer of Reproducibility Jul. 2023 - Oct. 2023
 - **Open Source Contribution:** Replicated the FedPara paper (ICLR 2022) and integrated the implementation into the Flower framework.
- **Fatima Fellowship** Remote
Researcher Jul. 2023 - Sept. 2024
 - **HyperKKL:** Worked with Dr. Umar Niazi (MIT postdoc) to extend the learning-based Luenberger observer to non-autonomous nonlinear dynamical systems (distribution shift problem in time series data). Employed low-rank meta-learning to adapt to new exogenous inputs. Built a Python framework to accelerate the PINN experiments.
- **DELL Technologies** Cairo, Egypt
Software Engineering Intern Sept. 2022 - Aug. 2023
 - **AI4Research for Scientific Breakthroughs:** Replicated the Delphi paper and utilized the S2AG dataset to build a 10M-node citation graph. Developed temporal PageRank centrality to identify influential papers. Built a pipeline to parse paper concepts, problems, and solutions, formalizing the scientific discoveries problem as a link prediction problem.
 - **5G Digital Twin:** Utilized Graph Neural Networks to leverage network topology to reduce latency. Built and benchmarked datasets through NS3 simulation for the Lena dual stripe model.
- **Incorta** Alexandria, Egypt
Machine Learning Intern Jul. 2021 - Oct. 2021
 - **Aspect-Based Sentiment Analysis:** Developed an aspect-based sentiment analysis model on clients' data.

PROJECTS

- **Network and Database Course:** Developed a car rental website using Flask, PostgreSQL, and Bootstrap, featuring advanced live search with Fetch API for an enhanced user experience. Also implemented a multi-threaded web server in C++ supporting HTTP/2 pipelining, logging, and caching, showcasing proficiency in both network protocols and database management.
- **Blockchain and Cybersecurity Course:** Implemented smart contracts and decentralized applications to explore blockchain technology. Conducted in-depth studies on encryption algorithms, network security protocols, and cryptographic systems to enhance secure communication and data integrity.
- **Algorithm Development in Computer Vision Course:** Implemented a wide range of computer vision algorithms from scratch, including image processing techniques, feature detection, segmentation, and object recognition, to deeply understand underlying principles and optimize performance.

AWARDS AND ACHIEVEMENTS

- **InSilico Medicine:** Ranked first in InSilico Drug Discovery hackathon.
- **NeurIPS Workshop:** Ranked first in both tracks, black box and beige box, for watermarking attacks in the "Erasing the Invisible" workshop. Developed a novel approach for watermarking classification, and diffusion models for adaptive attacks.
- **Google Hash Code:** Ranked in the top 5% in Hash Code 2022.
- **Mate ROV Competition:** 3rd place worldwide, 1st place in the Arab Regional, and awarded best ML team in 2021.
- **Microsoft Azure:** 1st team in Microsoft Azure ML ROV challenge 2021.

CERTIFICATES

- **McKinsey Forward Program:** Joined the McKinsey Forward Program, focusing on leadership, problem-solving, and business skills development.
- **Virginia Tech Hardware Design for Machine Learning Summer Training 2022:** Developed an FPGA accelerator (adopting a systolic array architecture) for accelerating convolutional neural network inference.
- **Lean Six Sigma - Yellow Belt:** Project on accelerating the research cycle.

SKILLS AND LANGUAGES

- **Programming Languages:** C++/C, Python, JavaScript, Java, Matlab
- **Libraries:** OpenCV, PyTorch Geometric, TensorFlow, SpaCy, NS3, ROS, Catapult, Flask, PyQt, Graph-tools
- **Frameworks:** Ray, Dusk, Slurm, Flower, Flask
- **Database Systems:** MySQL, PostgreSQL
- **Miscellaneous:** gRPC, Protobuf, Socket Programming, Docker, Git, Web Scraping, Automation Scripts
- **Languages:** Arabic (Native), English (C1), French (C1), German (A1)

EXTRACURRICULAR ACTIVITIES

- **M.I.A Robotics** Alexandria, Egypt
Machine Learning Lead *Aug. 2020 - Jul. 2022*
 - **Team Lead:** Trained and guided the 2022 ML team, developed models such as underwater object detection and segmentation, and autonomous UAV systems.
 - **ROV Control System:** Designed an adaptive 6 DOF controller for ROV using gain scheduling.
- **IEEE SSCS ALEXSC** Alexandria, Egypt
Head of Activities Team *Oct. 2019 - Aug. 2021*
 - **Event Planning:** Planned events for undergraduates, including visits, tech summits, and competitions (Chipions) to bridge the gap between academia and industry.