Mohammed ElKholy

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Education

- **The American University In Cairo** Cairo, Egypt
  Bachelor of Science - GPA: 3.84/4.0 *Sept 2020 - Dec 2023*
  Major: *Computer Science*
  Minor: *Mathematics*
  Courses: *Operating Systems, Computer Architecture, Analysis And Design Of Algorithms, Social Networks Analysis And Mining, Machine Learning, Deep Learning, Database Systems, Graph Theory, Stochastic Processes*

Skills Summary

- **Languages**: Python, C, C++, C#, JavaScript, TypeScript, SQL, Verilog
- **Frameworks**: Scikit, PyTorch, TensorFlow, Keras, OpenCV, NetworkX, PyG, React, NodeJS
- **Tools**: Docker, GIT, Azure SQL, MySQL, SQLite, SQLServer, .NET
- **Platforms**: Linux, Web, Windows, Azure
- **Soft Skills**: Communication, Writing, Quick Learner, Problem Solving, Time Management

Experience

- **Microsoft - Microsoft AI** Cairo, Egypt
  Applied Scientist *Nov 2024 - Present*
  - Part of the Shopping team at Microsoft AI.
  - Conducting research and designing experiments using SOTA Machine Learning techniques with large-scale data.
  - Training and deploying production-scale models.
- **Center of Nanoelectronics and Devices - AUC** Cairo, Egypt
  Full Stack Developer Intern *May 2024 - July 2024*
  - Responsible for developing and maintaining frontend and backend of different websites for the center.
  - Tech Stack includes: C#, .NET, CSS, HTML, JavaScript, SQL, SqlServer.
- **The American University in Cairo** Cairo, Egypt
  AI Research Assistant *Sept 2023 - Dec 2023*
  - Developing AI solutions for Respiratory sensor data.
  - Developed an approach that utilizes Short-time Fourier Transforms to improve performance over SOTA by 2-3%.
  - Tech Stack includes: Python, Numpy, Pandas, PyTorch, openCV, Matplotlib, Seaborn.
- **Genify** Remote
  NLP Research Intern *July 2023 - Oct 2023*
  - Curating different benchmark datasets and models for cross-lingual NER.
  - Conducting experiments against benchmark datasets and reporting results.
  - Tech Stack includes: Python, Numpy, Pandas, PyTorch, openCV, Matplotlib, Seaborn, Transformers.
- **WRC-Egypt** Remote
  Deep Learning Research Intern *June 2023 - August 2023*
  - Analyzing the different deep learning models present in literature on indoor localization, their strengths, and their drawbacks.
  - Developed an indoor localization system that utilizes Graph Neural Networks to learn representations that allow the system to generalize to unknown environments and changes in network configuration without finetuning.
  - 2nd place in the Student Research Competition at ACM SIGSPATIAL '23.
  - Tech Stack includes: Python, Numpy, Pandas, PyTorch, PyG (pytorch geometric), Matplotlib, Seaborn.

Publications

- **Virtual Graph Neural Networks: A Novel Approach for Building-Agnostic Indoor Positioning Systems.** In Proceedings of the 31st ACM International Conference on Advances in Geographic Information Systems (SIGSPATIAL '23)
- **Bridging the Gap: Efficient Cross-Lingual NER in Low-Resource Financial Domain.** In FinNLP-FNP-LLMFinLegal Workshop at the International Conference on Computational Linguistics (COLING '25)

Projects

- **Biological Network Analysis - (Bioinformatics, Statistics, Graphs)**: Research-oriented project where we aimed to find the most important transcription factors that upregulate a specific gene pathway responsible for wound healing. Tech: Python, NetworkX, SciPy, NumPy (Dec '22)
- **Tomasulo's Algorithm Simulator (Computer Architecture, Web Development)**: Developed a simulator for Tomasulo's algorithm for out-of-order instruction execution. Tech: Typescript, React, NodeJS, CSS, HTML (Dec '22)
- **RISC-V Processor (Computer Architecture, Hardware Description)**: Implemented a processor that supports all 40 unprivileged instructions for the RISC-V instruction set architecture. Tech: Verilog (Nov '22)
- **Property Finder (Database Systems, Web Scraping)**: Scraped a real estate website to gather information about different properties, hosted them onto an AzureSQL database and created a simple CLI program for querying different properties. Tech: Python, Scrapy, MySQL, AzureSQL (Nov '22)
- **RISC-V Disassembler (Assembly Language, RISC-V)**: Built a disassembler for 32-bit and 16-bit RISC-V Instruction Set Architecture. Tech: C++, RISC-V Assembly (July '22)
- **Convolutional Neural Network From Scratch (Machine Learning, Deep Learning, Computer Vision)**: Built a convolutional neural network from scratch using only NumPy in Python. This network was trained for classifying handwritten characters. Tech: Python, OpenCV, NumPy (April '22)