

Kareem Elozeiri

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EDUCATION

University of Science and Technology at Zewail City

6th of October, Egypt

B.Sc in Communications and Information Engineering GPA: 3.87/4.00 (Provost's Honors Rol)

Oct. 2020 – Aug. 2025

Relevant Courses: Data Structures & Algorithms, Database Systems, Operating Systems, Machine Learning, Deep Learning, Statistical Inference and Data Analysis, Information Theory.

EXPERIENCE

NLP Research Intern

May 2024 – July 2024

Mohamed bin Zayed University of Artificial Intelligence (MBZUAI)

Abu Dhabi, UAE

- Developed **machine-generated text** detection techniques on **M4** and **Outfox** datasets using RoBERTa and DeBERTa.
- Expanded dataset and fine-tuned models to detect **machine-polished** and **machine-humanized** essays and abstracts.
- Conducted **token** and **perplexity** analysis to enhance model explainability.
- Implemented **domain adversarial training** for a RoBERTa-based model to make detection domain independent.

Machine Learning Engineer (part-time)

July 2023 – May 2024

Online Dimensions

remote

- Worked on machine learning models for computer vision, NLP & time-series forecasting tasks.
- Developed ML pipelines using **Django**, **sklearn**, **tensorflow**, **PostgreSQL** & **bash**.

Undergraduate Machine Learning Research Assistant

Jul. 2023 – Present

Zewail City of Science and Technology

Egypt

- Worked on optimizing channel quality indicator prediction in **5G networks** using deep neural networks architectures.
- Work on optimizing radio planning and transmission site localization using **computer vision** and **search algorithms**.

Undergraduate Computer vision Research Assistant

Jan. 2023 – May. 2023

Zewail City of Science and Technology

Egypt

- Built a **segmentation-detection pipeline** for plant disease detection using **Resnet-50** and **CNNs** as part of precision agriculture project.
- Developed image processing flows for data cleaning and better field image capturing using **Python** & **OpenCV**.

PROJECTS

5G CQI Time series forecasting | *Python, Pandas, Sklearn, Tensorflow*

- Developed a **Convolutional Recurrent Neural Network (CRNN)** architecture to accurately predict channel quality factors in **5G networks**, enabling **optimized allocation** of network resources.
- Performed **input sequence length optimization** using **auto-correlation analysis**.

JPEG Compression | *Python, NumPy*

- Implemented from scratch the JPEG blocks: **DCT**, **Quantization**, **Run Length Code**, **Entropy Coding** using **Numpy**.
- For entropy coding used both Huffman and finite-precision arithmetic coding algorithms.

Lorenz Image Encryption | *Python, NumPy, Flask, React.js*

- Developed a **symmetric encryption algorithm** for images based on **lorenz attractor's chaotic nature**.
- Built a user-friendly React app with a REST Flask API backend for seamless utilization.

PUBLICATIONS

LLM-DetectAIve: a Tool for Fine-Grained Machine-Generated Text Detection | *EMNLP 2024 Demo*

- Mervat Abassy, **Kareem Elozeiri**, Alexander Aziz, Minh Ngoc Ta, Raj Vardhan Tomar, *et al*.
- Paper Link: <https://arxiv.org/abs/2408.04284>

TECHNICAL SKILLS

Languages: Python, C/C++, C#, Matlab, Go, Typescript, JavaScript, SQL, HTML/CSS.
Frameworks & Libraries: Tensorflow, Pytorch, pandas, NumPy, Flask, Django, Node.Js, React.Js.
Software & Tools: Linux, Git, Docker, MySQL, PostgreSQL.

ACHIEVEMENTS & AWARDS

- Selected from over 1,000 applicants to join the Undergraduate Research Internship Program (UGRIP) 2024 at MBZUAI.
- Dell Egypt AI Hackathon Semi-finalist (2023).
- 32nd nationally on Egypt in Thanawya Amma Math section (Egyptian High School System) (2020).