Faris Hamdi Rizk

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Education

Delta Higher Institute of Engineering and Technology (DHIET) **Mansoura, Egypt**
Bachelor of Engineering in Electronics and Communication — GPA: 3.2/4.0 *Sep. 2021 – Present*

- **Concentration**: Machine Learning and Computer Vision
- **Relevant Coursework**: Python Programming, Computer Science I & II, Signals Analysis, Micro-Processors, Statistics & Probability Theory, Linear Algebra, Calculus I & II, Discrete Mathematics, Projects management, Technical Writing
- **Independent Study**: Deep Learning for Computer Vision, Machine Learning, Data Analysis using Python, Image Processing, Data Structures & Algorithms, C/C++ Programming

Research Interests: Computer Vision & Language, Deep Learning, Robotics

Research Experience

Zewail City Computing Society **Remote — Zewail City of Science, Egypt**
Research Staff Member – *Applied Machine Learning Lab* *Sep. 2023 – Present*

- Onboarding and planning initial research projects in collaboration with lab members in Computer Vision, Natural Language Processing and Human-Computer Interaction.

Delta Higher Institute of Engineering and Technology (DHIET) **Mansoura, Egypt**
Undergraduate Research Assistant – *Supervisor: Prof. El-Sayed M. El-Kenawy* *Jan. 2023 – Present*

- Collaborated with the Computer Science and Intelligent Systems Research Center, VA, USA.
- Collaborated with Dr. Nima Khodadadi, University of Miami, FL, USA.
- Developed a computer vision-based pothole detection system using a remote-controlled car with high-definition cameras, an IMU, GPS, and STM32F401RCT6 microcontroller. Utilized CNN models (AlexNet, VGG19Net, GoogLeNet, ResNet-50), with AlexNet achieving 92.15% accuracy and the fastest processing time for real-time detection. The system captures road images, processes them using AlexNet, and transmits data via a LoRa-02 module to a remote station. This project honed my ability to address challenges like lighting variation and road debris.
- Optimized CNN models prediction with Waterwheel Plant Algorithm, improving traffic detection accuracy to 97.28%.
- Utilized deep learning architectures to predict traffic patterns for smart city development, achieving 93.18% accuracy.
- Implemented machine learning for oil spill detection via satellite imagery, achieving 96.88% accuracy.
- Optimized student performance prediction models using Greylag Goose algorithm and Waterwheel Plant Algorithm, reducing MSE by 50%.

Publications

- Abdelmalak M. E. S., Khodadadi N., Zaki A. M., Eid M. M., **Rizk F. H.**, et al. (2024). **Pothole Detection in Asphalt Roads: A Comprehensive Approach for Enhanced Road Maintenance and Safety with AlexNet Model**. In *Proceedings of the 2024 International Telecommunications Conference (ITC-Egypt)*, pp. 269–274. doi:10.1109/ITC-Egypt61547.2024.10620566.
- **Rizk F. H.**, Arkhstan S., Zaki A. M., Kandel M. A., & Towfek S. K. (2023). **Integrated CNN and Waterwheel Plant Algorithm for Enhanced Global Traffic Detection**. *Journal of Advanced Intelligent Systems*, **6**(2), 36–45. doi:10.54216/JAIM.060204.
- Sherif K., **Rizk F. H.**, Zaki A. M., Eid M. M., et al. (2024). **Revolutionizing Oil Spill Detection: A Machine Learning Approach for Satellite Image Classification**. In *Proceedings of the 2024 International Telecommunications Conference (ITC-Egypt)*, pp. 245–250. doi:10.1109/ITC-Egypt61547.2024.10620599.
- Kandel M. A., **Rizk F. H.**, Hongou L., Zaki A. M., Khan H., et al. (2023). **Evaluating the Efficacy of Deep Learning Architectures in Predicting Traffic Patterns for Smart City Development**. *Journal of Advanced Intelligent Systems*, **6**(2), 26–35. doi:10.54216/JAIM.060203.
- **Rizk F. H.**, Mohamed M. E., Sameh B., Zaki A. M., Eid M. M., et al. (2024). **Enhancing Student Performance Prediction with Greylag Goose Optimization Algorithm**. In *Proceedings of the 2024 International Telecommunications Conference (ITC-Egypt)*, pp. 32–37. doi:10.1109/ITC-Egypt61547.2024.10620568.
- **Rizk F. H.**, Elshabrawy M., Sameh B., Mohamed K., & Zaki A. M. (2024). **Optimizing Student Performance Prediction Using Binary Waterwheel Plant Algorithm for Feature Selection and Machine Learning**. *Journal of Advanced Intelligent Systems*, **7**(1), 19–37. doi:10.54216/JAIM.070102.

Skills

Programming Languages: Python (proficient), C/C++ (familiar)

Frameworks & Libraries: TensorFlow, Keras, PyTorch, Scikit-learn, OpenCV, NumPy, Pandas, Matplotlib

Tools: Jupyter Notebooks, Google Colab, Git/GitHub, Linux/Unix, LaTeX

Spoken Languages: English, Arabic (Native)

Extracurricular Activities

Google Developer Student Club (GDSC) — DHIET, Egypt

Graphic Design Head — *Oct. 2023 – Jun. 2024*

- Leading a team of 5 designers to create promotional materials, increasing event attendance by 30%.
- Overseeing club branding and visual identity across all platforms.

Google Developer Student Club (GDSC) — DHIET, Egypt

Graphic Designer — *Jan. 2023 – Oct. 2023*

- Designed graphics for events; collaborated on creative solutions, contributing to a 20% increase in social media engagement.

IHOW Organization — DHIET, Egypt

Human Resources Member — *Oct. 2022 – Jan. 2023*

- Managed recruitment and onboarding processes for over 30 new members.
- Facilitated communication and team-building activities to enhance collaboration.

Competitions and Awards

DevFest Mansoura Hackathon — Google Developer Group - Delta — Mansoura University, Egypt

2nd Place *(out of 25 teams)* — *Oct. 2023*

- Developed a web platform to connect freelancers with clients, enhancing local freelance opportunities in Egypt.