

# FARIS HAMDI RIZK

Mansoura, Egypt

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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. 2024 – 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 – Jun. 2024*

- 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.**, 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.**, 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.
- 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.
- 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.
- **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, L<sup>A</sup>T<sub>E</sub>X

**Spoken Languages:** English, Arabic (Native)

Extracurricular Activities

<b>Google Developer Student Club (GDSC)</b>	<b>DHIET, Egypt</b>
<i>Graphic Design Head</i>	<i>Oct. 2023 – Jun. 2024</i>
<ul style="list-style-type: none"><li>• Leading a team of 5 designers to create promotional materials, increasing event attendance by 30%.</li><li>• Overseeing club branding and visual identity across all platforms.</li></ul>	

<b>Google Developer Student Club (GDSC)</b>	<b>DHIET, Egypt</b>
<i>Graphic Designer</i>	<i>Jan. 2023 – Oct. 2023</i>
<ul style="list-style-type: none"><li>• Designed graphics for events; collaborated on creative solutions, contributing to a 20% increase in social media engagement.</li></ul>	

<b>IHOW Organization</b>	<b>DHIET, Egypt</b>
<i>Human Resources Member</i>	<i>Oct. 2022 – Jan. 2023</i>
<ul style="list-style-type: none"><li>• Managed recruitment and onboarding processes for over 30 new members.</li><li>• Facilitated communication and team-building activities to enhance collaboration.</li></ul>	

Competitions and Awards

<b>DevFest Mansoura Hackathon — Google Developer Group - Delta</b>	<b>Mansoura University, Egypt</b>
<i>2nd Place (out of 25 teams)</i>	<i>Oct. 2023</i>
<ul style="list-style-type: none"><li>• Developed a web platform to connect freelancers with clients, enhancing local freelance opportunities in Egypt.</li></ul>	