Dhieddine BARHOUMI

Machine learning Engineer

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Professional Summary

Machine Learning Engineer specializing in computer vision and autonomous systems, with hands-on experience in developing AI solutions for security, industrial automation, and autonomous driving. Proven expertise in optimizing deep learning models, implementing sensor fusion systems, and deploying production-ready AI applications. Demonstrated success in reducing system response times by 40% and improving model accuracy by up to 20% in real-world applications.

Education

National Engineer's Degree in Computer Science — September. 2020 – Present
National Institute of Applied Sciences and Technology (INSAT) — *Tunis, TN*

Relevant Courses: *Linear Algebra, Database Management, Algorithms and Data Structures, Deep Learning, NLP, Cloud Computing, Big Data, Optimization Methods, Reinforcement Learning*

Scientific Baccalaureate — September. 2017 – June 2020
Pioneer High School Hammam-Lif — *Ben Arous, TN*

Top 5% of bachelors with an excellent average grade.

Experience

AI Research Intern — March. 2025 – August. 2025
Institute For Machine Learning And Analytics (Hochschule Offenburg) — *Offenburg, DE*

- Selected as a DAAD KOSPIE Scholar for advanced AI research in autonomous driving.
- Developed sensor fusion models integrating LiDAR and cameras for enhanced perception.
- Implemented transformer-based deep learning to improve scene understanding.
- Simulated AI-driven perception in CARLA, refining models before real-world testing.
- Optimized multi-modal pipelines for better AI performance across diverse driving conditions.
- Trained and fine-tuned AI models using high-performance GPUs for real-time processing.
- Upon completion of this six-month internship, I will graduate.
- **Skills:** Sensor Fusion, Deep Learning, Transformers, CARLA, ROS2, PyTorch, Computer Vision, AI Optimization

AI in Security Systems Intern — June. 2024 – August. 2024
All Points Smart Solutions — *Amman, JO*

- Designed and implemented advanced AI security systems for historic sites including Ajloun Castle and Amman Citadel, enhancing real-time threat detection capabilities and reducing response time to incidents by 40%.
- Enhanced ANPR Accuracy by 20%, optimizing recognition for high-speed and low-light conditions on major streets in Amman.
- Integrated AI Models with Milestone VMS for intelligent object detection and motion tracking, automating alerts and cutting false alarms by 30%.
- Tested AI Surveillance Solutions for diverse environments, refining system adaptability.
- Adapted to International Work Environment, gaining experience in cross-cultural collaboration and project execution.
- **Skills:** AI Surveillance, ANPR, Computer Vision, Deep Learning, Python, Project Coordination, Resource Management

Computer Vision Intern — June. 2023 – July. 2023
DidaMind — *Ben Arous, TN*

- Conducted research on multiple computer vision algorithms, choosing YOLOv8 for optimal speed and accuracy.
- Fine-tuned YOLOv8 for detecting angle and gusset objects in boxes, achieving 92.5% precision and 60% mAP50-95.
- Deployed the model as a real-time API on Microsoft Azure, integrating it with a dashboard for defect detection.
- Automated quality control, triggering alerts for misaligned or missing objects as boxes moved on a conveyor.
- Collaborated with a multidisciplinary team to replace manual defect detection for an industry client, boosting efficiency by 30%.
- Completed Microsoft Azure AI Fundamentals training and certification during the internship.
- **Skills:** YOLOv8, Computer Vision, Microsoft Azure, API Development, Real-Time Systems, TensorFlow, Python

Projects

AI-Powered Loan Approval System — October. 2024 – November. 2024

- Developed a scalable machine learning application for real-time loan approval decisions.
- Designed an end-to-end pipeline including data ingestion, transformation, and model training with hyperparameter tuning.
- Implemented custom utilities, logging, and exception handling for efficient debugging and streamlined operations.
- Dockerized the application and hosted it on Azure Container Registry for scalable cloud deployment.
- Automated CI/CD processes with GitHub Actions, ensuring seamless integration and deployment to Azure Web App Service.
- **Skills:** Flask, Microsoft Azure, Docker, GitHub Actions, CI/CD, Hyperparameter Tuning

Reinforcement Learning-based Robot Navigation — September. 2023 – December. 2023

- Designed a reinforcement learning-based system to navigate complex indoor environments.
- Simulated realistic home-like environments in Gazebo with dynamic obstacles.
- Leveraged ROS2 for seamless integration, utilizing RViz for real-time monitoring of the robot's path and sensor data.
- Collaborated with colleagues, employing GitHub for CI/CD, ensuring robust version control and seamless updates.
- Implemented the TD3 algorithm with a custom reward function to optimize path planning and obstacle avoidance.
- **Skills:** Reinforcement Learning, ROS2, RViz, Gazebo, TD3, Python, GitHub, CI/CD, Simulation Environments

Technical Skills

Programming Languages: Python, C++, Java, SQL
AI/ML Frameworks: PyTorch, TensorFlow, Keras, scikit-learn, LangChain, Transformers
Computer Vision: YOLO, OpenCV, Image Processing, Object Detection, Semantic Segmentation
Deep Learning: CNNs, RNNs, Transformers, GANs, Transfer Learning, Fine-tuning
MLOps & Cloud: Docker, Kubernetes, CI/CD, Git, Google Cloud Platform, Azure ML, Vertex AI
Robotics: ROS2, CARLA, Gazebo, RViz, Sensor Fusion, Path Planning

Certifications

Professional Machine Learning Engineer (Google Cloud) — October. 2024
TensorFlow Professional Developer (DeepLearning.AI) — February. 2024
Deep Learning Specialization (DeepLearning.AI) — October. 2023
AI Engineering Professional Certificate (IBM) — July. 2023
AI Fundamentals (Microsoft Azure) — June. 2023

Languages

English: Professional Working Proficiency (TOEIC C1: 965/990)
French: Professional Working Proficiency
German: Pre-Intermediate
Arabic: Native Proficiency