Rassem Bali

Balirasem15@gmail.com — linkedin.com/in/rassem-bali — github.com/Rassembali

Education

ENET'Com - National School of Electronics & Telecommunications of Sfax Expected 2026
B.Sc. in Industrial Computer Engineering - Specialization in AI-driven Robotics & Computer Vision

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Experience

Robotics Intern - IMSR Sfax Jul–Aug 2025
- Trained **TurtleBot3 in Gazebo** using DQN for obstacle avoidance.
- Implemented **TinySLAM with SLAMBox (ROS2, Ubuntu)** for mapping & navigation.
- Enhanced reward shaping, improving navigation success rate.

DevOps Intern - KPIT Engineering Sfax Jun–Jul 2025
- Applied **Docker & Kubernetes** for scalable workflows.
- Researched **AI-driven CI/CD pipelines**.

Data Science Intern - Digital Research Centre of Sfax (CRNS) Jun–Aug 2024
- Built ML models (**TensorFlow, Scikit-learn**) to predict magnetocaloric performance.
- Deployed via **Streamlit**, reducing analysis time by **40%**.

Projects

AI Self-Driving Car - GTA V — Python, PPO, YOLOv8, RL Nov–Apr 2025
- Built an **autonomous driving system** in GTA V using supervised and reinforcement learning.
- Implemented **YOLOv8 semantic segmentation** (Road, Sidewalk, Car, Person) with F1-score: 0.91 and IoU: 0.84.
- Trained CNN models for **behavioral cloning**, achieving 76.7% validation accuracy.
- Designed a custom **reward function** to guide RL agent.
- Developed a **hybrid model (Supervised + PPO RL)**: improved recovery, adaptability, and highway driving.
- Deployed real-time pipelines for both CNN and PPO agents using Python automation scripts.

Tunisian License Plate OCR — Python, OpenCV, OCR Aug 2025
- Built a deep learning pipeline for **automatic license plate recognition**.
- Collected and preprocessed Tunisian plate dataset; applied **YOLOv8 + Tesseract OCR**.
- Achieved high detection accuracy and robust character recognition under varying lighting conditions.

Monocular Depth Estimation (MiDaS) - KITTI Dataset — PyTorch, DPT_Large 2024
- Applied the **MiDaS (DPT_Large)** model to predict relative depth from single RGB images; aligned predictions to the KITTI ground truth using per-image scale and shift.
- Evaluated performance with **MAE 4.19 m** and **RMSE 6.00 m** on 50 validation images.
- Visualized results: side-by-side comparisons of raw MiDaS output, aligned output, and LiDAR ground truth; plotted error distributions.

Achievements & Competitions

- 1st Place - **DAAD & ENET'Com Process Optimization Challenge 2025**.
- 2nd Place - **IEEE Human Exploration Rover Challenge**.
- 3rd Place - **AIDOLS 2.0 Hackathon**.
- 4th Place - **Mindshift Hackathon**.

Extracurriculars & Leadership

Computer Vision Trainer - ENET'Com Workshops 2025
- Trained and mentored **40+ students** on YOLOv8, OpenCV, MediaPipe, and Deep Learning.
- Delivered hands-on labs on CNNs and practical AI use cases.

IEEE PES Day Brand Ambassador 2024
- Led a team of **20 ambassadors**; coordinated planning and execution.
- Organized and hosted a **3-day online event** with **500+ viewers**.
- Acted as speaker and moderator; ensured cross-institution collaboration.

Skills

AI & Robotics: Reinforcement Learning (DQN, PPO), ROS2, SLAM, Gazebo
Machine Learning & Deep Learning: Supervised/Unsupervised ML, Neural Networks, TensorFlow, PyTorch, Scikit-learn, Keras
Computer Vision: YOLOv8, OpenCV, OCR, MiDaS, ArUco markers
Data & Cloud: Snowflake, dbt, Airflow, Great Expectations, AWS, GCP
Programming: Python, Java **Tools:** Streamlit, Git, Linux, Docker, Kubernetes
Languages: Arabic (Native), English (B2 - Upper Intermediate), French (B1 - Intermediate)