

# Ahmed BELGACEM

## Artificial Intelligence Research Engineer

✉ [ahmedbelgaacem@gmail.com](mailto:ahmedbelgaacem@gmail.com)    ☎ +32470528351    📍 Mons, Belgium    🐙 Github    🔗 LinkedIn    🌐 [ahmedbelgaacem.com](http://ahmedbelgaacem.com)

AI Engineer with strong **research and development** experience, especially in **deep learning** and **computer vision**. I've worked extensively on **fine-grained classification**, **diffusion models**, **edge computing**, and **medical imaging**, contributing to both cutting-edge experimentation and real-world deployment. With a solid foundation in software engineering, I bring a practical, systems-oriented mindset to AI development.

### PROFESSIONAL EXPERIENCE

**Deep Learning Research Scientist** 03/2024 – present | Mons, Belgium  
*Multitel - Research and Innovation Institute*

Contributed to the threat detection component of the RUDIS research project aimed at developing optionally unmanned military vehicles.

- Conceived a robust fine-grained classifier for military and civilian vehicles. The classifier leverages Multitask learning to differentiate vehicles at a detailed level and is optimized for resource-constrained environments.
- Currently developing a solution to address class imbalance in fine-grained classification by leveraging diffusion models, aiming to generate balanced training data and improve model performance on underrepresented categories.

**Deep Learning Research Engineer - Intern** 04/2023 – 10/2023 | Lyon, France  
*Diagnoly*

Worked on the development of an Edge AI system for real-time fetal ultrasound image analysis.

- Refactored, analyzed and profiled the existing solution to diagnose latency and overheating issues.
- Developed, optimized and deployed a deep multi-task model for classification and bounding box regression to considerably improve time-to-prediction and performance.
- **Pytorch** for modelisation, **Yolo** as base model, **Onnx** for Intermediate Representation, **TensorRT** for deployment and inference.

**Software Engineer - Intern** 03/2021 – 07/2021 | Tunis, Tunisia  
*Vneuron*

Development of a sanction screening software that reduces trade based money laundring's risk by checking a SWIFT transaction's compliance against different sanction lists.

- Designed a lexical search pipeline that uses **Elasticsearch** for indexing and conceived a relevance score calculation method.
- Developed a web platform using **Springboot** and **Angular**.
- Conceived a proof of concept for the semantic search pipeline using **sbert**.

**Software Engineer - Working Student** 06/2019 – 10/2019 | Tunis, Tunisia  
*Democracy International*

Web development for Democracy International's Tunisian local office.

- Built the organization's website and blog, trained the editors on the use of the blog.
- Maintained and debugged an electoral mapping data visualization platform.

### EDUCATION

**Big Data, Artificial Intelligence Masters Degree** 2021 – 2023  
*Université Paris Dauphine - PSL*

**Relevant Coursework:** Machine Learning, Deep Learning, Python, Reinforcement Learning, NLP, Data Analysis, Monte Carlo Tree Search, Time Series, R, Optimisation, Graph Neural Network, Computer Vision, Data Visualization, Cloud Computing.

**Software Engineering Masters Degree** 2016 – 2021  
*National Institute of Applied Sciences and Technology (INSAT)*

**Relevant Coursework:** Data Structures and Algorithms, Information Retrieval, Databases, Graph Theory, Software Quality, Design Patterns, Big Data, UML, Linux, Git, Python, Java, C, C++, Javascript, SQL.

### SKILLS

<b>Programming:</b> Python, SQL	<b>Machine Learning and Deep Learning:</b> Pytorch, ONNX, TensorRT, Scikit-Learn, XGBoost	<b>Tools and Libraries:</b> Docker, UML, Git, Linux, Pandas, Numpy, Matplotlib
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### LANGUAGES

<b>French</b> Bilingual proficiency	<b>English</b> Full professional proficiency	<b>Arabic</b> Native proficiency
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### PROJECTS

- Graph Neural Network: Building a Spotify Playlist Track Recommender**
- Data visualization: Development and deployment of a data visualization dashboard using the Panel framework.**
- Python: Creation and distribution of TunAugmentor a Python library for Image Data Augmentation.**
- Deep Learning: Development of an Image classification model for the Kenyan Sign Language with Keras.**