Omar AbedelKader

Lille, France

About Me

I am an AI researcher with extensive experience in artificial intelligence and software engineering.
I am currently pursuing a Ph.D. in Computer Science at the University of Lille.

Responsibilities

- Founder and Maintainer of the organization **Pharo-LLM**
- Member of the Organizing Committee, GDR-GPL'26
- Member of the Organizing Committee, **ESUG'26**, **ESUG'25**, **ESUG'24**.
- Sub reviewer at **BENEVOL'25**
- Project Leader and Maintainer for multiples projects (**ChatPharo**, **Pharo-Copilot**, **Pharo-Infer**…)
- Mentor in **GSoC'26**, **GSoC'25**
- President of **NeuroTech-Lille**, a student association focused on AI and neuroscience.
- Contributor at **Ministère de la Transition Écologique** (***Club IA et Transition écologique***)
- Member in the organization **Pharo-AI**
- Contributor at **Conseil National du Numérique (CNNum)** (*Café IA*)
- Supervised numerous software and AI projects at both Licence and Master's levels, including research-oriented and applied industry projects

Publications

- AbedelKader, O., Ducasse, S., Zaitsev, O., Robbes, R., & Polito, G. (2025). Package-Aware Approach for Repository-Level Code Completion in Pharo. *International Workshop on Smalltalk Technologies*. DOI: 10.48550/arXiv.2601.05617.

Experience

AI Researcher — INRIA (Villeneuve-d'Ascq, France) ***Oct. 2024 – Oct. 2027***

- Improving code completion and code generation using LLMs, specifically targeting the Pharo programming language, which has limited training data.
- Developing techniques for code completion, type inference, and deployment in Pharo's IDE, with a focus on runtime performance.

AI Engineer — INERIS (Verneuil-en-Halatte, France) ***Sept. 2023 – Sept. 2024***

- Developed "INERIS-IA," a tool to classify textual documents according to INERIS's strategic goals using ML and NLP techniques.
- Created Boolean queries for document retrieval and improved corpus quality through document similarity and keyword extraction.

Intern — AI Researcher — LIPN (Villetaneuse, France) ***June 2023 – Aug. 2023***

- Compared sampling techniques for probabilistic planning, particularly for generating literary narratives.
- Evaluated methods including the Score Function Estimator (SFE) and advanced techniques such as Gumbel-Softmax, assessing their effectiveness in producing coherent and creative stories.

Software Developer — BEON-IT (Beirut, Lebanon) ***May 2022 – June 2022***

- Java · Design Patterns · .NET Framework · Threading · Microsoft SQL Server

Full-Stack Developer — SSCC-IT (Andket, Lebanon) ***Nov. 2020 – Apr. 2021***

- PHP & SQL · Design Patterns · Microsoft SQL Server

Education

University of Lille — Villeneuve-d'Ascq, France

Ph.D. in Computer Science
(Oct. 2024 – Present)

University of Lorraine — Nancy, France

M.Sc. in Natural Language Processing
(Sept. 2022 – Sept. 2024)

Lebanese University — Beirut, Lebanon

B.Sc. in Data Science
(Sept. 2019 – July 2022)

Software

Pharo-Copilot

- Intelligent code completion and generation tool for Pharo, inspired by GitHub Copilot.
- Focused on repository and package -level code completion.
- Leveraged LLMs to improve developer productivity in a dynamically typed language.
- **GitHub Repository:** Pharo-Copilot

ChatPharo

- Live conversational interface between Pharo developers and large language models.
- Enables interactive discussions with LLMs directly from the Pharo environment.
- Designed an open and extensible architecture to experiment with multiple LLM backends.
- **GitHub Repository:** ChatPharo

INERIS-IA

- AI platform developed at INERIS for document classification and knowledge management.
- Built a Flask-based web interface integrating multiple ML and NLP models.
- Trained document classification models aligned with COP 2027 objectives and INERIS strategic themes.
- Implemented additional features including document similarity, keyword extraction, and corpus quality improvement.
- **GitHub Repository:** INERIS-IA

Family Dynamics Analysis

- This project analyzes family dynamics in France using Formal Concept Analysis (FCA).
- Using data from the French national census, the study identifies patterns in family structures, single-parent households, childbearing decisions, and naturalization through marriage across five regional zones.
- The project explores relationships between demographic variables such as marital status, household composition, and nationality, offering insights into cultural and social trends shaping French households.
- **GitHub Repository:** Family Dynamics Analysis
- **Paper:** PDF

Real–Fake Face Detection

- Demonstrates the process of building and training a neural network for classification tasks.
- Walks through data preprocessing, model architecture design, training, evaluation, and visualization of results to assess performance and prediction accuracy.
- **GitHub Repository:** real-fake-detection

EESMACF

- Evaluates two NLP models—SBERT (Sentence-BERT) and MiniLM—for classifying analogies using the FrameNet dataset.
- The objective is to identify valid and invalid analogies by leveraging SBERT embeddings and a fine-tuned MiniLM classifier.
- MiniLM achieved 99% accuracy in distinguishing valid from invalid analogies, outperforming SBERT (~55% accuracy).
- **GitHub Repository:** EESMACF
- **Paper:** PDF

DeGatto

- Sentiment analysis framework for e-commerce women's apparel reviews.
- Uses a Kaggle dataset (23,000+ sentences) with aspect-level annotations for material, size, design, and comfort.
- Evaluated multiple NLP/DL/ML models (BiLSTM, SVM, Logistic Regression, Multinomial Naive Bayes). BiLSTM performed best for sentence-level analysis, and LinearSVC performed well for aspect-level analysis.
- Includes a visualization tool built with ReactJS and NodeJS to display results as bar or pie charts.
- **GitHub Repository:** DeGatto
- **Paper:** PDF

Teaching

- Teaching assistant at IUT: *Introduction to Software Development* 41,5 h TP
- Teaching assistant at IUT : *Software Maintenance* 12h TD
- Teaching assistant at Polytech: *DataBase* 16h TP
- Teaching assistant at Polytech: *Internet* 12h TP

Talks

ChatPharo: An Open Architecture for Understanding How to Talk Live to LLMs — ESUG 2025

- **Slides:** PDF
- **Video:** *Coming soon*

Awards and Honors

Awards:

- Best Paper Award (3rd place) — IWST 2025, Gdańsk, Poland
  "Package-Aware Approach for Repository-Level Code Completion in Pharo"

Honors:

- Featured Alumni Testimonial — IDMC 2024, University of Lorraine *"Alumni testimonial in NLP & AI featured on the official IDMC Institute website."* Link

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Technologies & Skills

- **Programming Languages:** Python, Pharo, Java, JavaScript,
- **Machine Learning & Deep Learning:** TensorFlow, PyTorch, Keras, Scikit-learn
- **Natural Language Processing (NLP):** spaCy, NLTK
- **Big Data & Distributed Systems:** Apache Spark, Hadoop
- **Data Analysis & Visualization:** Pandas, Matplotlib, Seaborn
- **Scientific Computing:** NumPy, SciPy
- **Web Development:** Flask, Django, Laravel, ReactJS
- **Databases & Cloud:** MongoDB, MySQL, AWS
- **Operating Systems:** macOS, UNIX, Windows

- **Research Areas:** Artificial Intelligence, Software Engineering, AI4SE, SE4AI

Volunteering

NeuroTech-Lille — President (2024–Present)

- Led the executive board and coordinated association activities and projects.
- Managed the annual budget, including financial planning, expense tracking, and funding allocation.
- Represented the association in meetings with university administration, partners, and sponsors.
- Oversaw event planning, workshops, and conferences related to neurotechnology.
- Supervised team members and ensured effective collaboration across departments.
- Defined strategic goals and ensured alignment with the association's mission.

Ministère de la Transition Écologique — Contributor (Club IA et Transition écologique) (2023–Present)

- Contributed to ongoing AI-driven projects supporting ecological transition initiatives within the French government.
- Assisted in the development and evaluation of AI use cases for public policy and environmental impact.
- Collaborated with interdisciplinary teams, including policymakers, researchers, and technical experts.
- Participated in strategic discussions on responsible and sustainable AI deployment in the public sector.

Conseil National du Numérique (CNNum) — Contributor (Café IA) (2023–Present)

- Contributed to national discussions on artificial intelligence, digital policy, and societal impact.
- Assisted in the preparation and facilitation of Café IA sessions bringing together experts, researchers, and public stakeholders.
- Participated in the analysis of AI trends, use cases, and regulatory challenges.
- Supported knowledge-sharing initiatives on responsible and ethical AI.

Croix-Rouge Française — Volunteer First Aider (2022–2023)

- Provided first aid and emergency assistance during public events and operations.
- Responded to medical emergencies following established safety and emergency protocols.
- Collaborated with multidisciplinary teams under high-pressure situations.
- Maintained readiness through regular training in first aid and emergency response.

Hobbies

- **Water Activities:** Swimming · Diving
- **Outdoor and Adventure Sports:** Hiking · Skiing · Skydiving
- **Creative and Artistic Activities:** Photography
- **Precision Sports:** Boxing · Bowling · Golf

Languages

- **Arabic:** Native
- **French:** Native
- **English:** B2

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AbedelKader, O., Ducasse, S., Zaitsev, O., Robbes, R., & Polito, G. (2025). Package-Aware Approach for Repository-Level Code Completion in Pharo. *International Workshop on Smalltalk Technologies*. https://doi.org/10.48550/arXiv.2601.05617