

Bochra Kader

PhD Candidate in Computer Science

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Research Profile

PhD candidate at **University Paris Dauphine–PSL (LAMSADE, Paris)**, supervised by **Maude Manouvrier** and **Khalid Belhajjame**. Thesis: *On Managing Dynamic Knowledge Graphs*. My research focuses on the **maintenance and evolution of dynamic knowledge graphs and ontologies**, combining **Semantic Web technologies** with **human-guided reinforcement learning** to support reliable updates, reduce inconsistency, and improve data quality under change.

Education

- 2023–present **PhD in Computer Science (Contractual Doctoral Researcher)**, *Université Paris Dauphine–PSL, LAMSADE, Paris, France*
Thesis: *On Managing Dynamic Knowledge Graphs*. Advisors: Maude Manouvrier; Khalid Belhajjame.
- 2022 **M.Sc. (Master 2) in Information Systems and Web (SIW)**, *École Supérieure d'Informatique (ESI-SBA), Sidi Bel-Abbès, Algeria*
- 2017–2022 **State Engineer Degree in Computer Science**, *École Supérieure d'Informatique (ESI-SBA), Sidi Bel-Abbès, Algeria*
- 2017 **Mathematics Baccalaureate**, Algeria

Research Experience

- 09/2023–present **PhD Researcher (Contractual Doctoral Researcher)**, *Université Paris Dauphine–PSL, LAMSADE, Paris, France*
- Study **knowledge graph maintenance under change** (evolving facts, schemas, and constraints), with emphasis on **ontology evolution** and requirement-driven updates.
 - Investigate maintenance of **RDF-based KGs built from tabular data sources** in response to **evolving application requirements** (beyond changes in data sources).
 - Develop **Hologram**, a framework that assists users in specifying mappings for **newly added ontology elements** with minimal manual effort.
 - Formalize the mapping task (populating new concepts/relationships introduced through ontology evolution) as learning **Steiner trees** over a **schema graph** representing data source structures.
 - Combine **Reinforcement Learning** with **human feedback** (human-in-the-loop / human-guided RL) to guide learning effectively and efficiently in an interactive setting.
 - Conduct empirical experiments showing that *Hologram* can produce **high-quality mappings** with **minimal user input**.
 - Model KG maintenance as a **sequential decision problem** to recommend update/repair actions while balancing **quality improvement** and **update cost**.

Publications & Preprints

- Submitted **B. Kader, M. Manouvrier, K. Belhajjame**. *Human-Guided Reinforcement Learning for Knowledge Graph Maintenance*. Submitted to RCIS 2026.
- Dataset Khan, J. A.; Cavalleri, E.; Ravinder, R.; **Kader, B.**; Matela, J.; Gangemi, A. *FLIP-KG: Enriching Automated Knowledge Graph Extraction with Tacit Knowledge. The Case of Lyrical Implicatures within Poems* (dataset). Zenodo, 2024. DOI: [10.5281/zenodo.11654289](https://doi.org/10.5281/zenodo.11654289).

Scientific Communications & Academic Activities

- Posters MADICS 2024 — Poster presentation; ISWS Summer School 2024 — Poster presentation.
- Talk LAMSADE Doctoral Seminar, 10 April 2025 — Presentation of thesis topic and initial research approach.
- Schools Participant, MenaML Winter School 2026 — International Winter School on Machine Learning, King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

Teaching Experience

- 2025–2026 **Teaching Assistant (tutorials & labs)**, *Université Paris Dauphine–PSL*, Paris, France
Total: 69h (70.95 HTD).
 - *Computer Concepts* (L1, lab): 39h.
 - *Algorithms and Programming 3* (L2, tutorials): 15h.
 - *Algorithms and Programming 3* (L2, lab): 15h.
- 2024–2025 **Teaching Assistant (labs)**, *Université Paris Dauphine–PSL*, Paris, France
Total: 63h (63 HTD).
 - *Semi-structured Data* (L3, lab): 24h.
 - *Computer Tools — Databases / Excel (RO) / Internet* (L1, labs): 36h.

Industry Experience

- 11/2022–
12/2024 **Remote Frontend Developer**, *HEXAEE*, Boumerdès, Algeria
 - Developed web applications using Angular and Firebase; collaboration and delivery with Azure DevOps.
 - Projects: autism project; employee management project.
- 01/2022–
09/2022 **Practical Internship (Information Systems Department – DSI)**, *Hasnaoui Group of Companies*, Sidi Bel-Abbès, Algeria
 - Web/mobile platform for concrete quality management; dashboards with Power BI.
 - State-of-the-art review on big data in the health sector.

Technical Skills

- Semantic Web RDF, OWL, SPARQL, SHACL; RML.
- Programming Languages Python; nodeJS; C; C++; Java.
- Machine Learning Reinforcement Learning; Human-in-the-Loop Learning.
- Databases MySQL, Oracle; MongoDB, Cassandra.
- Tools & Methods Power BI; UML; Scrum.
- Professional Skills Communication; Collaboration; Creative Problem Solving.

Languages

Arabic (native) | French (professional) | English (professional)

References

Dr. Maude Manouvrier

Professor of Computer Science

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Dr. Khalid Belhajjame

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