

Professional Activities Summary

LE Ngoc Luyen

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1. Current Professional Position

I am currently a **Research Engineer** at **Gamaizer.ia** (Paris) and an associated researcher at the **Heudiasyc Laboratory (UMR 7253), Université de Technologie de Compiègne (UTC)** under a contract (12/2024–05/2026) focusing on the development of knowledge bases and generative AI services for competency management and learner guidance.

Previously (05/2021–10/2024), I was a **contract researcher** at UTC (Heudiasyc) as part of the ANR **Vivocaz** project, dedicated to knowledge-graph-based recommender systems for the buying and selling of used vehicles.

2. Educational Background

- **PhD in Computer Science**, IMT Atlantique, Brest, France (11/2016–09/2020).
Topic: *Analysis of discourse representation structure for French* (funded by Crédit Mutuel ARKÉA).
- **Master in Computer Science – Intelligent Systems and Multimedia** (double degree, honors), Institut Francophone International (IFI), Hanoi, Vietnam (11/2013–11/2015), in partnership with:
 - the ICONE Master’s program at the University of La Rochelle (France),
 - the Master’s program in Computer Science at Vietnam National University, Hanoi.
- **Engineering Degree in Computer Science**, University of Da Lat, Vietnam (09/2006–01/2011).

3. Professional Experience

3.1. Academic Experience

Research Engineer / Associated Researcher

Gamaizer.ia & Université de Technologie de Compiègne (Heudiasyc) – Paris & Compiègne, France

12/2024 – 05/2026

- Development of knowledge bases for competency management and mapping.
- Design of a collaborative competency management portal integrating semantic web technologies and language models (LLMs) for explanation and recommendation.

- Contribution to the FORTEIM (France 2030) and Prometheus-X Edge-Skills projects (see Section 5).

Contract Researcher

Université de Technologie de Compiègne (Heudiasyc) & Vivocaz (ANR-21-PRRD-0072-01) – Compiègne, France
05/2021 – 10/2024

- Design of an **ontology for vehicle models** and buying/selling processes.
- Proposal of a **user contextual profile ontology** centered on buyers' needs and constraints.
- Development of **semantic similarity methods on RDF data** for vehicle search.
- Implementation of personalized recommender systems based on Protégé, SPARQL, AllegroGraph, and Python.

Doctoral Contract

IMT Atlantique (Lab-STICC) & Crédit Mutuel ARKÉA (AI Innovation Department) – Brest, France
11/2016 – 03/2020

- Proposed approaches for automatically building **Combinatory Categorical Grammar (CCG) trees** for French.
- Developed algorithms for transforming dependency structures into CCG derivation trees.
- Designed a **BiLSTM+CRF** model for **CCG supertagging**, exploiting morphological and dependency information.
- Conducted research on **discourse representation structure (DRS)** for French.

Lecturer-Researcher

University of Da Lat – Faculty of Information Technology – Da Lat, Vietnam
06/2011 – 11/2019

- Teaching in Java programming, advanced web programming, and network programming.
- Supervision of final-year projects.
- Led the development of the faculty's online training management system (C#, ASP.NET).
- Website administrator and content editor for the faculty.

3.2. Industrial and R&D Experience

Crédit Mutuel ARKÉA – AI Innovation Department, Brest, France

- Industrial partner of my doctoral research; co-development of tools for automatic understanding of customer requests (linguistic analysis, ontologies, extraction of missing information).

Vivocaz, Compiègne, France

- R&D on a recommender system and a used-vehicle sales platform based on knowledge graphs and deep learning models.

4. Research Activities

4.1. Research Topics

My work is organized around several complementary areas:

1. Recommender systems, data science, and deep learning

- Context-aware, multi-criteria, and group recommendation.
- Deep learning models (multi-head attention, feature interaction learning) for heterogeneous data.

2. Semantic web, knowledge graphs, and ontologies

- Domain modeling (vehicle sales, competency management, crisis management).
- Semantic similarity in RDF graphs, SPARQL queries, and knowledge integration.

3. Natural language processing (NLP) and language models (LLMs)

- CCG supertagging and semantic parsing (DRS) for French.
- Use of LLMs for skill decomposition, recommendation explanations, and enriched information retrieval.

4. Applications to education, crisis management, and competency management

- Ontologies and competency graphs for monitoring and recommending learning pathways.
- Recommender systems for crisis simulations and decision-maker preparedness.

4.2. Scientific Output (selection)

I am the author or co-author of **more than 30 publications** (journal articles, international and national conference papers, book chapters, etc.), including:

International Journal Articles

- LE N.L., M.-H. Abel. *Integrating context and criteria: a multi-head attention-based approach for multi-criteria group recommender systems*. World Wide Web, 2025.
- LE N.L., M.-H. Abel, P. Gouspillou. *Enhancing Context-Aware Recommender Systems through Deep Feature Interaction Learning*. Journal of Multi-Criteria Decision Analysis, 2025.
- J. Zhong, LE N.L., E. Negre, M.-H. Abel. *Ontology-based crisis simulation system for population sheltering management*. SIMULATION, 2024.

International Conferences (recent examples)

- LE N.L., M.-H. Abel. *Automated Skill Decomposition Meets Expert Ontologies: Bridging the Granularity Gap with LLMs*. MEDES 2025.
- LE N.L., M.-H. Abel. *How Well Do LLMs Predict Prerequisite Skills? Zero-Shot Comparison to Expert-Defined Concepts*. IEEE SMC 2025.
- LE N.L., M.-H. Abel. *Joint Group Profiling and Recommendation via Deep Neural Network-based Multi-Task Learning*. CSCWD 2025.

National Conferences and Workshops (example)

- N.L., M.-H. Abel, B. Laforge. *Toward an Ontological Framework for Competency Management: for Training, Recruitment, Occupations, or Related Research*. IC Conference, 2025.

The full list of publications is available on *Google Scholar*: <https://scholar.google.fr/citations?user=tFnk5VIAAAAJ> and is also included in the appendix (Publications).

5. Projects and Collaborations

ANR Vivocaz Project (ANR-21-PRRD-0072-01)

- Design of a personalized recommender system for the used-vehicle market, integrating knowledge graphs, ontologies, deep learning, and user interfaces.
- Close collaboration with the company Vivocaz and academic partners.

FORTEIM Project (France 2030 – CINav)

- Participation in the FORTEIM project dedicated to training for the ecological transition in maritime professions.
- Contributions to competency modeling, knowledge graph design, and integration of learning traces for pathway monitoring and recommendation of educational resources.

Prometheus-X – Edge-Skills Project

- Involvement in the *Ikigai Games for Citizens – Edge-Skills* use case, focused on exporting and importing competency maps to job-matching services.
- Contributions to personal competency graph architecture, use case definition, testing plans, and integration with LRSs, PLRSs, and data space connectors (PDC/PDI).

Collaboration with Gamaizer.ia

- Development of an ecosystem for competency management and visualization based on knowledge graphs and LLMs.

Collaboration with Sorbonne University (crisis management)

- Collaboration with a Sorbonne University team on crisis modeling and management, focusing on crisis ontologies, simulation systems, and decision-support recommender systems.
- Co-publications on population sheltering simulation systems and on the use of knowledge graphs and collaborative technologies to contextualize crises (e.g., HICSS, INFORSID).

6. Teaching Activities

6.1. Courses Taught

University of Da Lat (2011–2019)

- Java programming.
- Advanced web programming.
- Network programming.
- Preparation of course materials, lab sessions, and projects.

Université de Technologie de Compiègne (UTC)

- Participation in the supervision of master’s and engineering projects on the following topics:
 - recommender systems, knowledge graphs, AI for education,
 - used-vehicle search, optimization of semantic similarity algorithms, learning from RDF graphs.

6.2. Student Supervision

Doctoral Supervision (ongoing scientific mentoring)

- **Rachel Pirault** – PhD student in narratology and educational video games (CIFRE Gamaizer – LIRCES, Université Côte d’Azur, ED SHAL) – 2025-2028.
Topic: *AI-assisted narrative design for educational video games.*
Role: **Scientific tutor**, focusing on generative AI, modeling narrative structures for serious games, and integrating AI tools into edugame design workflows.
- **Oussama Seddini** – PhD student in computer science (CIFRE Le Mans Université – LIUM / Gamaizer) – 2025-2028
Topic: *Generative AI assistance for the creation of educational activities in Mixed Reality (MIXAP / MIXAP-EU, MRKitGen, IA-Tutor project).*
Role: **Scientific tutor** (LLMs, multi-agent systems, xAPI), focusing on AI architecture design, trace analysis (logs, xAPI), systematic review of AI + MR for education, and scientific dissemination.

Master’s and Engineering Projects

- 2024–2025 (engineering program, UTC): *Comparison and evaluation of methods for computing semantic similarity on RDF data.*
- 2023–2024 (master’s, semesters I & II, UTC):
 - *Improvement and optimization of a vehicle recommender system through a mobile application.*
 - *Used-vehicle search application based on a recommender system.*
- 2022–2023 (master’s, UTC): *Learning the user-item relationship from knowledge graphs.*

7. Administrative and Collective Responsibilities

- Team leader for the development of the Faculty of Computer Science online training management system (University of Da Lat).
- Administrator of the faculty website: content updates and coordination with the teaching team.

- Participation in the writing and implementation of research projects (ANR Vivocaz, FORTEIM, Prometheus-X, collaborations with companies and universities).

8. Knowledge Transfer and Relations with the Socio-Economic Sector

- **Banking and financial services (Crédit Mutuel ARKÉA):** use of NLP, CCG, and DRS to understand appointment requests and identify missing information.
- **Used-vehicle sales (Vivocaz):** development of a recommender system integrating knowledge graphs, domain ontologies, and deep learning models.
- **Competency management and education (Gamaizer.ia, UTC):** design of competency graphs, learning pathway analysis tools, and educational recommender systems based on learning traces and language models.

9. Service to the Scientific Community

9.1. Reviewing Activities

- Reviewer for several journals:
 - International Journal of Electrical and Computer Engineering (IJECE),
 - Journal of Contingencies and Crisis Management,
 - Engineering Reports,
 - PeerJ Computer Science,
 - Journal of Multi-Criteria Decision Analysis (JMCDA).
- Reviewer for conferences:
 - IEEE SMC (2023, 2025),
 - CSCWD (2023, 2025),
 - ICITS, ICECCME, etc.

9.2. Scientific Committees and Organization

- Member of the program committee or technical committee for:
 - The 26th International Conference on Computer Supported Cooperative Work in Design (CSCWD 2025),
 - The 1st International Workshop on Sustainable Governance and Social Responsibility based on AI Approaches (2026).

10. Summary and Perspectives

My career lies at the intersection of **semantic web**, **recommender systems**, **NLP/LLMs**, and **data science**, with strong application grounding in banking, mobility, crisis management, education, and competency management.

In the medium term, I intend to continue developing:

- **explainable recommender systems** based on knowledge graphs and LLMs, applied to competency management and education;
- **neuro-symbolic approaches** combining language models, ontologies, and graphs for pathway analysis and personalization;
- increased involvement in the **supervision of students and PhD candidates**, participation in national and international collaborative projects (FORTEIM, Prometheus-X, etc.) in the domain of education.

I am also actively involved in the scientific mentoring of PhD students and in structuring projects such as FORTEIM (France 2030) and Prometheus-X Edge-Skills, which reinforces the link between my research, educational innovation, and the needs of socio-economic partners.

Appendix: Publications

International Peer-Reviewed Journal Articles

- [32] *LE Ngoc Luyen, Marie-Hélène ABEL. Integrating context and criteria: a multi-head attention-based approach for multi-criteria group recommender systems.* World Wide Web, Volume 28, article number 50, 2025. [⟨doi:10.1007/s11280-025-01358-8⟩](https://doi.org/10.1007/s11280-025-01358-8) (Q1, IF: 3.4)
- [31] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU. Enhancing Context-Aware Recommender Systems through Deep Feature Interaction Learning.* The Journal of Multi-Criteria Decision Analysis (JMCD), 2025. [⟨doi:10.1002/mcda.70012⟩](https://doi.org/10.1002/mcda.70012) (Q2, IF: 2.4)
- [30] *Jinfeng ZHONG, LE Ngoc Luyen, Elsa NEGRE, Marie-Hélène ABEL. Ontology-based crisis simulation system for population sheltering management.* Transactions of The Society for Modeling and Simulation International, 2024. [⟨doi:10.1177/00375497231214563⟩](https://doi.org/10.1177/00375497231214563) (Q2, IF: 2.0)

International Peer-Reviewed Conference Papers

- [29] *Ngoc Luyen Le, Marie-Hélène Abel. Automated Skill Decomposition Meets Expert Ontologies: Bridging the Granularity Gap with LLMs.* International Conference on Management of Digital EcoSystems (MEDES), Nov 2025, Ho Chi Minh City, Viet Nam. [⟨arXiv:2510.11313⟩](https://arxiv.org/abs/2510.11313)
- [28] *Ngoc Luyen Le, Marie-Hélène Abel. How Well Do LLMs Predict Prerequisite Skills? Zero-Shot Comparison to Expert-Defined Concepts.* IEEE International Conference on Systems, Man, and Cybernetics (SMC), Oct 2025, Vienna, Austria. [⟨arXiv:2507.18479⟩](https://arxiv.org/abs/2507.18479)
- [27] *Ngoc Luyen Le, Marie-Hélène Abel, Bertrand Laforge. Modeling and Visualizing Competency Progression: A Semantic Integration of Pedagogical Graphs and Generative AI.* International Meeting for Innovative Pedagogy (IMIP25), Apr 2025, Compiègne, France. [⟨hal-05151429⟩](https://hal.archives-ouvertes.fr/hal-05151429)
- [26] *LE Ngoc Luyen, Marie-Hélène ABEL. Joint Group Profiling and Recommendation via Deep Neural Network-based Multi-Task Learning.* 26th International Conference on Computer Supported Cooperative Work in Design (CSCWD), May 2025, Compiègne, France. [⟨hal-05001120⟩](https://hal.archives-ouvertes.fr/hal-05001120)

- [25] *LE Ngoc Luyen, Marie-Hélène ABEL*. **Enhancing Recommender System Using Textual Embeddings from Pre-trained Language Models**. 8th International Conference on Information Technology and Systems (ICITS), 2025, Mexico. [⟨hal-05001083⟩](#)
- [24] *LE Ngoc Luyen, Marie-Hélène ABEL*. **Context-Aware Multi-Criteria Recommender Systems Using Variable Selection Networks**. Proceedings of the 11th International Conference on Advanced Intelligent Systems and Informatics (AISI 2025), Jan 2025, Port Said, Egypt, pp. 3–15. [⟨hal-04961071⟩](#)
- [23] *LE Ngoc Luyen, Marie-Hélène ABEL*. **From Individual to Group: Developing a Context-Aware Multi-Criteria Group Recommender System**. 16th International Conference of Digital Ecosystems (MEDES), 2024, Naples, Italy.
- [22] *LE Ngoc Luyen, Marie-Hélène ABEL, Elsa NEGRE*. **Recognizing Similar Crises through the Application of Ontology-based Knowledge Mining**. 57th Hawaii International Conference on System Sciences, Jan 2024, Hawaii, United States. [⟨arXiv:2401.03770⟩](#)
- [21] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU*. **Combining Embedding-Based and Semantic-Based Models for Post-Hoc Explanations in Recommender Systems**. 2023 IEEE Conference on Systems, Man, and Cybernetics (SMC), Oct 2023, Hawaii, United States. [⟨arXiv:2401.04474⟩](#)
- [20] *LE Ngoc Luyen, Jinfeng ZHONG, Elsa NEGRE, Marie-Hélène ABEL*. **CORec-Cri: How Collaborative and Social Technologies Can Help to Contextualize Crises?**. 2023 IEEE Conference on Systems, Man, and Cybernetics (SMC), Oct 2023, Hawaii, United States. [⟨arXiv:2310.02143⟩](#)
- [19] *LE Ngoc Luyen, Marie-Hélène ABEL, Elsa NEGRE*. **Designing a User Contextual Profile Ontology: A Focus on the Vehicle Sales Domain**. 6th International Conference on Information and Knowledge Systems (ICIKS 2023), Portsmouth, United Kingdom. [⟨arXiv:2308.06018⟩](#)
- [18] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU*. **Improving Semantic Similarity Measure Within a Recommender System Based on RDF Graphs**. 6th International Conference on Information Technology & Systems (ICITS 2023), Lecture Notes in Networks and Systems, vol. 691, Springer, Cham. [⟨hal-04161309⟩](#)
- [17] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU*. **A Constraint-based Recommender System via RDF Knowledge Graphs**. 26th International Conference on Computer Supported Cooperative Work in Design (CSCWD), May 2023, Rio de Janeiro, Brazil. [⟨10.1109/CSCWD57460.2023.10152701⟩](#)
- [16] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU*. **A Personalized Recommender System Based on Knowledge Graph Embeddings**. 3rd International Conference on Artificial Intelligence and Computer Vision (AICV 2023), Lecture Notes on Data Engineering and Communications Technologies, vol. 164, Springer, Cham. [⟨hal-04101826⟩](#)
- [15] *LE Ngoc Luyen, Jinfeng ZHONG, Elsa NEGRE, Marie-Hélène ABEL*. **Constraint-based Recommender System for Crisis Management Simulations**. 56th Hawaii International Conference on System Sciences, Jan 2023, Hawaii, United States. [⟨10125/102854⟩](#)
- [14] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU*. **Towards an Ontology-based Recommender System for the Vehicle Sales Area**. Progress in Artificial Intelligence & Robotics: Algorithms & Applications. ICDLAIR 2021. Lecture Notes in Networks and Systems, vol. 441, Springer, Cham. [⟨10.1007/978-3-030-98531-8_13⟩](#)

- [13] *LE Ngoc Luyen, Yannis HARALAMBOUS. CCG Supertagging Using Morphological and Dependency Syntax Information.* Computational Linguistics and Intelligent Text Processing (CICLing 2019). Lecture Notes in Computer Science, vol. 13451, Springer, Cham. [⟨hal-02110790⟩](#)
- [12] *LE Ngoc Luyen, Yannis HARALAMBOUS, Philippe LENCA. Towards a DRS Parsing Framework for French.* 6th International Conference on Social Networks Analysis, Management and Security (SNAMS), Oct 2019, Granada, Spain. [⟨hal-02280800⟩](#)
- [11] *LE Ngoc Luyen, Anne Tireau, Aravind Venkatesan, Pascal Neveu, Pierre Larmande. Development of a Knowledge System for Big Data: Case Study to Plant Phenotyping Data.* 6th International Conference on Web Intelligence, Mining and Semantics (WIMS'16). ACM, Article 27, 1–9. [⟨hal-01411565⟩](#)

National Peer-Reviewed Conference Papers

- [10] *Ngoc Luyen Le, Marie-Hélène Abel, Bertrand Laforge. Vers un cadre ontologique pour la gestion des compétences : à des fins de formation, de recrutement, de métier, ou de recherches associées.* 36es Journées francophones d'Ingénierie des Connaissances (IC 2025) @ PFIA, 2025, Dijon, France. [⟨hal-05147866⟩](#)
- [09] *LE Ngoc Luyen, Gildas Tagny Ngompé. Extraction de relations multi-étiquettes en utilisant des modèles pré-entraînés et des couches de Transformer.* Actes de l'atelier TextMine 2025, conférence Extraction et Gestion des Connaissances (EGC), Jan 2025, Strasbourg, France. [⟨hal-04919844⟩](#)
- [08] *Jinfeng Zhong, Ngoc Luyen Le, Elsa Negre, Marie-Hélène Abel. Système de simulations de crises, basé sur une ontologie, pour la mise à l'abri des populations.* 42e conférence INFormatique des ORganisations et Systèmes d'Information et de Décision (INFORSID), 2024, Nancy, France. [⟨inforsid24-57-58⟩](#)
- [07] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU. Construction d'un système de recommandation basé sur des contraintes via des graphes de connaissances.* 34es Journées francophones d'Ingénierie des Connaissances (IC 2023) @ PFIA, Jul 2023, Strasbourg, France. [⟨hal-04152530⟩](#)
- [06] *LE Ngoc Luyen, Jinfeng Zhong, Elsa Negre, Marie-Hélène ABEL. Système de recommandations basé sur les contraintes pour les simulations de gestion de crise.* 34es Journées francophones d'Ingénierie des Connaissances (IC 2023) @ PFIA, Jul 2023, Strasbourg, France. [⟨hal-04152504⟩](#)
- [05] *LE Ngoc Luyen, Marie-Hélène ABEL, Philippe GOUSPILLOU. Apport des ontologies pour le calcul de la similarité sémantique au sein d'un système de recommandation.* 33es Journées francophones d'Ingénierie des Connaissances (IC 2022), Jun 2022, Saint-Étienne, France. [⟨hal-03675591v2⟩](#)

Posters

- [04] *LE Ngoc Luyen, Yannis HARALAMBOUS, Philippe LENCA. Detection of missing information in a discussion thread.* Computer Science Department Day, IMT Atlantique 2018, L'Aberwrac'h, France. [⟨RG.2.2.22822.24644⟩](#)
- [03] *LE Ngoc Luyen, Stéphane Jouannic, Pascal Gantt, Pierre Larmande. Development of a Generic Indexing Tool to Optimize the Use of Biological Data.* JOBIM 2015, Clermont-Ferrand, France. [⟨lirmm-01274707⟩](#)

Theses and Dissertations

- [02] *LE Ngoc Luyen*. **French Language DRS Parsing**. PhD dissertation, defended on September 15, 2020, IMT Atlantique, Brest, France. ⟨tel-03132658⟩
- [01] *LE Ngoc Luyen*. **Development of a Knowledge System for Big Data: Application to Rice Phenotyping Data (*O. sativa*)**. Master's dissertation, defended on November 30, 2015, IFI, Hanoi, Vietnam. ⟨vnu-memoire⟩