Pierre Monnin
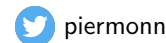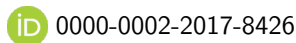
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Junior Fellow in Artificial Intelligence

Summary

I am a Junior Fellow in AI at Université Côte d'Azur, member of the Wimmics team. Previously, I was a researcher in Artificial Intelligence in the industry, with Orange, in Belfort, France. I received my Doctoral degree in Computer Science from Université de Lorraine, Nancy, France, in 2020.

My research focuses on the different steps of the knowledge graph lifecycle (construction, knowledge discovery, matching, refinement, mining), and their usage in various downstream applications (*e.g.*, recommender systems, explainable AI). I am particularly interested in interactions between domain knowledge represented in knowledge graphs and different forms of reasoning in a neurosymbolic perspective (*e.g.*, benefits of injecting domain knowledge in Machine Learning models, analogical reasoning). My work involves both theoretical and applied perspectives, often in interdisciplinary settings (*e.g.*, biomedical, educational domains). I was the Principal Investigator of the ECLADATTA French national project and I am an Investigator of the AT2TA French national project (both funded by the French National Research Agency).

Contents

Current positions

Since Sept. 2023   **Junior Fellow in AI – Université Côte d'Azur – Sophia Antipolis, France**
Research within the Wimmics team of I3S laboratory
Teaching within EFELIA Côte d'Azur ($\sim$ 128h of teaching)

2023 – 2024   **Temporary lecturer – TELECOM Nancy – Nancy, France**
18-hour class about artificial intelligence

International research stays

Jan. 2024   **Visiting Fellow – Università degli Studi di Bari Aldo Moro – Bari, Italy**
3-week visit with Claudia d'Amato
Grant of 4k€ from I3S laboratory

Education

2016 – 2020   **PhD in Computer Science – Université de Lorraine – Nancy, France**

Matching and mining in knowledge graphs of the Web of data
Applications in pharmacogenomics

- Knowledge matching: identification of identical, more specific, or related knowledge units
  - Rule-based approach with ontology-based preorders
    (ICCS 2020 [31])
  - Graph embedding and clustering-based approach with Graph Convolutional Networks
    (DL4KG@ESWC 2019 [5], Semantic Web Journal [23])
- Knowledge mining
  - Scalable mining of path patterns
    (ALGOS 2020 [14])
  - Extension of Formal Concept Analysis to refine ontology class hierarchies
    (ISMIS 2017 [15], BDA 2017 (poster) [39], FCA4AI@IJCAI-ECAI 2018 [25])
- Explainable AI
  - Interpretable features and models to reproduce expert classifications of drugs causing or
    not side effects (post-hoc explanations)
    (BMC Medical Informatics and Decision Making [6])
- Throughout all works: importance of domain knowledge represented in ontologies
- Applications on real data in pharmacogenomics: more than 50k n-ary relationships linking sets
  of drugs, genetic factors, and phenotypes, from heterogeneous sources (different vocabularies,
  levels of granularity)
- Construction and maintenance of PGxLOD, a knowledge graph about pharmacogenomics
  (BMC Bioinformatics [7])
- Emphasis on Open Science
  - Codes on GitHub
  - Public knowledge graph and ontology
  - Deployability and reproducibility with Docker containers

Keywords: Ontology, n-ary Tuple, Preorder, Graph Embedding, Path Pattern, Formal Concept
Analysis

Within the PractiKPharma project funded by the French National Research Agency (ANR)

Thesis supervisors :

- Amedeo Napoli (Senior Researcher, CNRS, LORIA)
- Adrien Coulet (Associate Professor, Université de Lorraine, LORIA)

Thesis written and defended in English on December 16th, 2020 with the following committee:

Chair	Marianne Clausel	Full Professor, Université de Lorraine, IECL
Reviewers	Claudia d'Amato	Associate Professor, University of Bari
	Fabien Gandon	Senior Researcher, Inria Sophia Antipolis - Méditerranée
Examiners	Céline Rouveirol	Full Professor, Université Sorbonne Paris Nord
	Matthias Samwald	Associate Professor, Medical University of Vienna

2012 – 2015 **Engineering Diploma (M.Sc. equivalent) – TELECOM Nancy – Nancy, France**
Major in Software engineering – Valedictorian

Engineering master thesis
3D visualization applied to aircraft MRO.
What purposes? What technologies? What developments?
Based on my internship at Swiss AviationSoftware – Graded 17/20

2010 – 2012 **Integrated preparatory class – ECE – Paris, France**
Valedictorian

2010 **Scientific Baccalaureate – Lycée Stanislas – Villers-Lès-Nancy, France**
Major in Mathematics – with distinction

Previous professional positions

2020 – 2023 **Researcher – Orange – Belfort, France**
Permanent contract
Knowledge Engineering and Machine Learning for knowledge graph construction and refinement

2022 – 2023 **Temporary lecturer – TELECOM Nancy – Nancy, France**
8-hour class about knowledge-based systems

2016 – 2020 **PhD student in Computer Science – LORIA / Université de Lorraine – Nancy, France**

2019 – 2020	Temporary teaching and research fellow (ATER) – IDMC	∼ 192h of teaching
2016 – 2019	Teaching assistant – TELECOM Nancy	∼ 64h of teaching per year

2015 – 2016 **Temporary lecturer – TELECOM Nancy – Nancy, France**
∼14h of teaching

2015 – 2016 **Software developer – Swiss AviationSoftware – R&D department – Basel, Switzerland**
6-month internship; followed by a permanent contract
Development of a UI component to display animated 3D models from aircraft documentation
State of the art, software architecture, test driven development, and continuous integration

2010 – 2015 **Private teacher – Student tutoring associations**
Private lessons or groups of 10 to 30 students
Mathematics, programming, compiler theory, signal processing

2014 **Student Entrepreneurship Department (PeeL) – Université de Lorraine – Nancy, France**
3-month internship; entrepreneurial project
Technical development (image processing, video mapping), training (financing, legal, communication), client and shareholder meetings, market analysis

2013 **Caisse d'Epargne – Human Resources Information System – Metz, France**
3-month fixed-term contract
Development of a software analyzing HR databases to automatically produce organization charts (divisions, positions, people)
Software architecture, technical development, user support and training

2012 **Caisse d'Epargne – Human Resources Information System – Metz, France**
9-week internship
Agile development of a software for career management within a 3-person team

Awards

- **Best student research paper award [8]** at the 21st European Semantic Web Conference (ESWC 2024)

- **Best resource paper award [9]** at the 21st European Semantic Web Conference (ESWC 2024)

- **Best paper award [13]** at the 23rd International Conference on Knowledge Engineering and Knowledge Management (EKAW 2022)

- **Best paper award [36]** at the French Conference IC ("Ingénierie des connaissances" - Knowledge Engineering) 2022 co-located with PFIA 2022

- **Best thesis award [45]** at French Conference EGC 2022, awarded by the French Association EGC ("Extraction et Gestion des Connaissances" - Knowledge Extraction and Engineering)

- **1st prize [21]** (Accuracy Track) at the Semantic Web Challenge on Tabular Data to Knowledge Graph Matching 2021, co-located with the 20th International Semantic Web Conference (ISWC 2021)

- **3rd prize [22]** at the Semantic Web Challenge on Tabular Data to Knowledge Graph Matching 2020, co-located with the 19th International Semantic Web Conference (ISWC 2020)

Funding of research projects

ECLADATTA (2023 – 2026)	**Principal Investigator (2023); Associate Member (2023 – 2026)** French National Research Agency (ANR) Generic Call 2022 I set up and led during 6 months this 42-month project which aims at proposing a joint pipeline for extracting and reconciling knowledge from texts, tables, and knowledge graphs. After leaving my position at Orange, I became an associate member. Funding for my institution (Orange): 196k€ Total project funding: 601k€ Partners: EURECOM, IRIT, Orange (PI)
AT2TA (2023 – 2026)	**Investigator** French National Research Agency (ANR) Generic Call 2022 This 42-month project aims at exploring the theory and applications of analogical reasoning. I am co-leading the work package on use cases and applications. I am leading the task studying interactions between knowledge management and analogical reasoning. After leaving my position at Orange, I transferred this project to Université Côte d'Azur. Funding for my institution (Orange then Université Côte d'Azur): 30k€ Total project funding: 669k€ Partners: LORIA (PI), IHU Imagine, IRIT, Inria, Infologic, Université Côte d'Azur

Community services

Event organization activities

3rd M4D2	Co-organizer with Miguel Couceiro 3rd Symposium Mathematics for Decision and Discovery ∼ 20 attendees
PGx Track 2024	Co-organizer with Adrien Coulet Within the Ontology Alignment Evaluation Initiative 2024 (OAEI 2024)
Neuro-symbolic AI 2023	Co-general chair with Zied Bouraoui and Fatiha Saïs International workshop supported by AfIA and GDR RADIA Co-located with the international conference ECSQARU 2023 ∼ 80 attendees
PGx Track 2023	Co-organizer with Adrien Coulet Within the Ontology Alignment Evaluation Initiative 2023 (OAEI 2023)

ATA 2023	General co-chair with Miguel Couceiro, Fadi Badra, and Esteban Marquer International workshop on Analogies: from Theory to Applications Co-located with the international conference ICCBR 2023 $\sim$ 25 attendees
ISWC 2022	Proceedings & Metadata co-chair with Giuseppe Pirrò 21st International Semantic Web Conference $\sim$ 500 attendees
ATA 2022	General co-chair with Miguel Couceiro, Esteban Marquer, and Pierre-Alexandre Murena International workshop on Analogies: from Theory to Applications Co-located with the international conference ICCBR 2022 $\sim$ 25 attendees
ALGOS 2020	General co-chair with Miguel Couceiro and Amedeo Napoli International conference on ALgebras, Graphs and Ordered Sets $\sim$ 200 attendees

Reviewing activities

- International Journals

  - Transactions on Graph Data and Knowledge (Editorial Board member)
  - Special Issue "Analogies: from Mathematical Foundations to Applications and Interactions with ML and AI" in Annals of Mathematics and Artificial Intelligence (Guest Editor)
  - Special Issue in honor of Maurice Pouzet in Discrete Mathematics & Theoretical Computer Science (Guest Editor)
  - Special Issue on Tools & Systems of the Semantic Web Journal (Guest Editorial Board member)
  - Special Issue on Ontology Matching and Machine Learning of the Semantic Web Journal (Guest Editorial Board member)
  - Semantic Web Journal
  - Journal of Web Semantics
  - International Journal of Approximate Reasoning
  - Data & Knowledge Engineering
  - AI Communications
  - Discrete Mathematics & Theoretical Computer Science
  - Communications Medicine
  - SoftwareX

- International Conferences

  - SAC 2025 (Knowledge & Natural Language Processing Track Program Committee member)
  - TheWebConf 2025 (Semantics & Knowledge Track Program Committee member)
  - EKAW 2024 (Program Committee member)
  - ISWC 2024 (Posters & Demos Track Program Committee member)
  - CIKM 2024 (additional reviewer)
  - ECML-PKDD 2024 (Research Track Program Committee member)
  - ECAI 2024 (Program Committee member)
  - ESWC 2024 (Resources Track Program Committee member)
  - TheWebConf 2024 (Program Committee member)
  - ISWC 2023 (Research Track Program Committee member)
  - ECML-PKDD 2023 (Research Track Program Committee member)
  - EKAW 2022 (additional reviewer)
  - MedInfo 2021 (reviewer)
  - IJCAI 2019 (assistant reviewer)

- International Workshops
  - AIMLAI, co-located with ECML-PKDD 2024 (subreviewer)
  - DL4KG, co-located with ISWC 2023 (Program Committee member)
  - AIMLAI, co-located with ECML-PKDD 2023 (subreviewer)
  - IARML, co-located with IJCAI 2023 (Program Committee member)
  - DL4KG, co-located with ISWC 2022 (Program Committee member)
  - IARML, co-located with IJCAI-ECAI 2022 (Program Committee member)
- National Conferences
  - RJCIA 2024 (Program Committee member)
- Funding agencies
  - Région Normandie – WINNINGNormandy Fellowship Program (2022)

Miscellaneous

- Member of the "Cognitive AI" W3C Community Group
- Member of GDR RADIA ("Groupement De Recherche Raisonnement, Apprentissage et Décision en Intelligence Artificielle" – Research Group on Reasoning, Learning, and Decision in Artificial Intelligence)
- Member of SIF ("Société informatique de France" – French Computer Science Society)

Supervision

PhD students (2)

Mar. 2023 – Mar. 2026 **Lucas Jarnac – Orange / Université de Lorraine**
Reconciliation of uncertain knowledge from heterogeneous sources for knowledge graph refinement
Co-supervised with Miguel Couceiro
I supervised Lucas Jarnac until the end of my contract with Orange (August 2023)
Publications: [12, 27, 33, 42]

Sept. 2021 – Sept. 2024 **Nicolas Hubert – Université de Lorraine**
From semantic-aware to semantic-driven knowledge graph embedding models for link prediction
Even though I am not his supervisor, I collaborate with Nicolas and his supervisors (Armelle Brun and Davy Monticolo) on his thesis.
Publications: [3, 8, 9, 11, 13, 18, 40, 41]

Interns and student projects (19)

Apr. 2024 – Aug. 2024 **Adrien Chassaing-Monjou, M.Sc. Year 2 (Bac+5)**
5-month internship
Analogical Reasoning for Knowledge Graph Refinement
Co-supervised with Miguel Couceiro

Mar. 2024 – Jul. 2024 **Guillaume Méroué, M.Sc. Year 2 (Bac+5)**
4-month internship
Analogical Reasoning for Link Prediction in Knowledge Graphs
Co-supervised with Fabien Gandon

Oct. 2023 – Mar. 2024 **Lynda Attouche, M.Sc. Year 2 (Bac+5)**
6-month research project
Improving automatic text classification by leveraging class hierarchies
Co-supervised with Catherine Faron and Molka Dhouib

Oct. 2023 – Mar. 2024	**Guillaume Méroué, M.Sc. Year 2 (Bac+5)** 6-month research project Analogical Reasoning for Link Prediction in Knowledge Graphs Co-supervised with Miguel Couceiro
Oct. 2023 – Jun. 2024	**Mohammad Al Takach, Abbas Awarkeh, Bassem Jaber, M.Sc. Year 1 (Bac+4)** 8-month research project Analogical Reasoning for Link Prediction in Knowledge Graphs Co-supervised with Miguel Couceiro
Jun. 2023 – Aug. 2023	**Adrien Chassaing-Monjou, M.Sc. Year 1 (Bac+4)** 3-month internship Exploring analogical proportions to align Knowledge Graphs Co-supervised with Miguel Couceiro and Esteban Marquer
Oct. 2022 – Jun. 2023	**Omar Abedelkader, Juba Ait-Abdelmalek, Ekaterina Kozachenko, M.Sc. Year 1 (Bac+4)** 8-month research project Exploring analogies for automatic semantic annotation taking into account context Co-supervised with Stergos Afantenos, Miguel Couceiro, and Esteban Marquer
Oct. 2022 – Jun. 2023	**Adrien Chassaing-Monjou, Chadi Hani, M.Sc. Year 1 (Bac+4)** 8-month research project Exploring analogical proportions between and within Knowledge Graphs Co-supervised with Miguel Couceiro and Esteban Marquer
Sept. 2022 – Feb. 2023	**Li-Fan Zhao, M.Sc. Year 2 (Bac+5)** 5-month research project Knowledge extraction from tabular data in Electronic Health Records Co-supervised with Adrien Coulet and Bastien Rance
Mar. 2022 – Sept. 2022	**Lucas Jarnac, M.Sc. Year 2 (Bac+5)** 6-month internship Creation of an Enterprise Knowledge Graph: bootstrapping and knowledge reconciliation Publication: [17]
Jun. 2019 – Aug. 2019	**Melvin Moreau, B.Sc. Year 2 (IUT Bac+2)** 2-month internship Updating PGxLOD with the newest versions of the integrated Linked Open Data sets Co-supervised with Amedeo Napoli
Jan. 2018 – May 2018	**Benoît Frapiccini, Gabi Portelli, M.Sc. Year 1 (Bac+4)** 5-month research project Extracting drug side effects from clinical annotations of PharmGKB to refine PGxLOD Co-supervised with Adrien Coulet
Jun. 2017 – Aug. 2017	**Graziella Husson, M.Sc. Year 1 (Bac+4)** 3-month internship Refining PGxLOD (integrating Linked Open Data sets, transforming PharmGKB data into RDF) Co-supervised with Adrien Coulet Publication: [7]

Available software and data

- PGxLOD, a knowledge graph to integrate pharmacogenomic knowledge
  `https://pgxlod.loria.fr`

- PGxO, an ontology to represent pharmacogenomic knowledge
  `https://pgxo.loria.fr`

- YAGO4-LP, link prediction datasets based on the YAGO4 knowledge graph
  `https://doi.org/10.5281/zenodo.10677792`

- Wikidata Thematic Subgraph Selection, datasets to train and evaluate algorithms to select thematic subgraphs of interest in a large knowledge graph from seed entities of interest
  `https://doi.org/10.5281/zenodo.8091583`
- Pharmacogenomics datasets for Ontology Matching, datasets based on the PGxLOD knowledge graph to evaluate Ontology Matching algorithms on a structure-based instance matching task from the domain of pharmacogenomics
  `https://doi.org/10.5281/zenodo.8419361`
- analogical-pruning, an analogy-based pruning model for subgraph selection
  `https://github.com/Orange-OpenSource/analogical-pruning`
- PyGraft, a Python tool to generate synthetic schemas and knowledge graphs
  `https://github.com/nicolas-hbt/pygraft`
- KGPrune, an API and Web application to extract subgraphs from Wikidata around user-input entities of interest while avoiding topical drift
  `https://kgprune.loria.fr`
- Code of other experiments on GitHub
  `https://github.com/pmonnin`

Technical skills

Software and Web development	C, C++, Java, VBA, Python, HTML5 & CSS3
DBMS	Oracle, MySQL, MongoDB, Virtuoso
Semantic Web	RDF, RDFS, OWL, SPARQL
Machine Learning, Data Mining	
Version control	Git, SVN
Containerization	Docker
Software	Matlab, LaTeX
Operating systems	Windows, macOS, Linux (bash scripting)
Project management	Agile methods (Scrum), Test Driven Development

Languages

French	Mother tongue
English	Fluent – TOEIC score: 915/990
Spanish	Basics

Miscellaneous

Music	Alto saxophone
Reading	Thrillers, science-fiction, fantasy, philosophy, psychology, computer science
Sports	Running, hiking
French driving license	

Publications

4 selected publications

- Lucas Jarnac, Miguel Couceiro, and **Pierre Monnin**. "Relevant Entity Selection: Knowledge Graph Bootstrapping via Zero-Shot Analogical Pruning". In: *Proceedings of the 32nd ACM International Conference on Information and Knowledge Management, CIKM 2023, Birmingham, United Kingdom, October 21-25, 2023.* ACM, 2023, pp. 934–944. DOI: 10.1145/3583780.3615030. URL: `https://arxiv.org/pdf/2306.16296.pdf`

  This conference paper presents an approach to build a domain-specific knowledge graph by selecting sub-graphs of interest from a large generic graph (such as Wikidata). The originality of this approach lies *(i)* in the fact that we are the first to formalize and precisely evaluate this task, and *(ii)* in the use of analogical reasoning in a neuro-symbolic perspective. Experiments show that our approach achieves comparable or better performance

than state-of-the-art models such as LSTM, including in a transfer setting on entities not seen in training, while having 150 to 800 times fewer parameters. These results underline the value of combining different forms of reasoning in artificial intelligence approaches. The method and datasets are made available in an Open Science vision to enable comparative evaluation of subsequent models.

- Nicolas Hubert, **Pierre Monnin**, Armelle Brun, and Davy Monticolo. "Sem@K: Is my knowledge graph embedding model semantic-aware?" In: *Semantic Web* 14.6 (2023), pp. 1273–1309. DOI: 10.3233/SW-233508

  This journal paper presents the Sem@K metric, which measures the semantic validity of graph embedding models. This metric is applicable to link prediction tasks and measures the validity of the entities predicted by the models w.r.t. relation signatures (type constraints in domain and range). This article introduces three versions of Sem@K that take into account the presence or absence of types, potentially hierarchically organized. Our evaluation of a large panel of model families shows common behaviors by family, as well as a trade-off between Sem@K and traditional performance metrics based on the rank of gold entities. Our metric therefore complements the traditional rank-based evaluation and assesses the ability of models to capture relation signatures while being agnostic to them during training. Our approach is aligned with the research direction aimed at overcoming the limitations of traditional model evaluation and neuro-symbolic approaches aimed at qualifying knowledge and abstractions learned by models. This article is the extended version of the work presented at the EKAW 2022 international conference (best paper award) [13] and at the DL4KG 2022 international workshop [18]. Resources developed (code and datasets) are made available to the community.

- **Pierre Monnin**, Chedy Raïssi, Amedeo Napoli, and Adrien Coulet. "Discovering alignment relations with Graph Convolutional Networks: A biomedical case study". In: *Semantic Web* 13.3 (2022), pp. 379–398. DOI: 10.3233/SW-210452

  This journal paper presents a neuro-symbolic matching approach based on graph embeddings (Graph Convolutional Networks and the Soft Nearest Neighbor Loss) and clustering. We measured the improvements in matching results when enriching the graph prior to training with the results of different inference rules associated with domain knowledge (e.g., class hierarchy, inverse of predicates). We also observed that distances in the embedding space are coherent with the "strength" of the different preexisting alignment relations (e.g., smaller distances for equivalences). Since the model was agnostic to these different alignment types, this could correspond to the emergence of a semantics in the embedding space. These observations open interesting perspectives: *(i)* they advocate for the further integration of domain knowledge within embedding models, and *(ii)* they let us consider clustering and distances in the embedding space as a means to suggest alignment relations. This second perspective is in line with current neuro-symbolic works that aim at associating semantics to latent representation spaces of embedding models. Resources developed (code and datasets) are made available to the community.

- **Pierre Monnin**, Joël Legrand, Graziella Husson, Patrice Ringot, Andon Tchechmedjiev, Clément Jonquet, Amedeo Napoli, and Adrien Coulet. "PGxO and PGxLOD: a reconciliation of pharmacogenomic knowledge of various provenances, enabling further comparison". In: *BMC Bioinformatics* 20-S.4 (2019), 139:1–139:16. DOI: 10.1186/s12859-019-2693-9

  This journal paper presents the construction and usage of the PGxLOD knowledge graph that integrates pharmacogenomic knowledge from the PharmGKB specialized database, and the biomedical literature (automatic relation extraction from text). The paper also introduces a first rule-based approach to match these n-ary complex knowledge units and measure overlaps between their sources. On the application side, this knowledge graph is a major resource as it offers a consolidated view of the available knowledge in the domain of pharmacogenomics, and allows to measure the complementarity between original knowledge sources. On the computer science side, this graph is an interesting data set for matching and mining approaches because of the specific characteristics of pharmacogenomic knowledge units: their heterogeneous and complex representation (n-ary relations), and their number (50 000 relations).

  PGxLOD has become one main output of the French national research project PractiKPharma. It was used to represent knowledge units extracted during the project, and served as the experimental setting for matching and mining approaches. This article and associated artifacts illustrate my commitment to develop both necessary approaches and data sets to advance the state of the art, and to make them publicly available in an Open Science perspective.

List of publications

* equal contributions

International journals

[1] Claudia d'Amato, Louis Mahon, **Pierre Monnin**, and Giorgos Stamou. "Machine Learning and Knowledge Graphs: Existing Gaps and Future Research Challenges". In: *Transactions on Graph Data and Knowledge* 1.1 (2023), 8:1–8:35. DOI: 10.4230/TGDK.1.1.8.

[2] Jiaoyan Chen, Hang Dong, Janna Hastings, Ernesto Jiménez-Ruiz, Vanessa López, **Pierre Monnin**, Catia Pesquita, Petr Skoda, and Valentina A. M. Tamma. "Knowledge Graphs for the Life Sciences: Recent Developments, Challenges and Opportunities". In: *Transactions on Graph Data and Knowledge* 1.1 (2023), 5:1–5:33. DOI: 10.4230/TGDK.1.1.5.

[3] Nicolas Hubert, **Pierre Monnin**, Armelle Brun, and Davy Monticolo. "Sem@K: Is my knowledge graph embedding model semantic-aware?" In: *Semantic Web* 14.6 (2023), pp. 1273–1309. DOI: 10.3233/SW-233508.

[4] Jixiong Liu, Yoan Chabot, Raphaël Troncy, Viet-Phi Huynh, Thomas Labbé, and **Pierre Monnin**. "From Tabular Data to Knowledge Graphs: A Survey of Semantic Table Interpretation Tasks and Methods". In: *Journal of Web Semantics* (2022), p. 100761. ISSN: 1570-8268. DOI: 10.1016/j.websem.2022.100761.

[5] **Pierre Monnin**, Chedy Raïssi, Amedeo Napoli, and Adrien Coulet. "Discovering alignment relations with Graph Convolutional Networks: A biomedical case study". In: *Semantic Web* 13.3 (2022), pp. 379–398. DOI: 10.3233/SW-210452.

[6] Emmanuel Bresso*, **Pierre Monnin***, Cédric Bousquet, François-Élie Calvier, Ndeye Coumba Ndiaye, Nadine Petitpain, Malika Smaïl-Tabbone, and Adrien Coulet. "Investigating ADR mechanisms with Explainable AI: a feasibility study with knowledge graph mining". In: *BMC Medical Informatics and Decision Making* 21.1 (2021), p. 171. DOI: 10.1186/s12911-021-01518-6.

[7] **Pierre Monnin**, Joël Legrand, Graziella Husson, Patrice Ringot, Andon Tchechmedjiev, Clément Jonquet, Amedeo Napoli, and Adrien Coulet. "PGxO and PGxLOD: a reconciliation of pharmacogenomic knowledge of various provenances, enabling further comparison". In: *BMC Bioinformatics* 20-S.4 (2019), 139:1–139:16. DOI: 10.1186/s12859-019-2693-9.

International conferences

[8] Nicolas Hubert, **Pierre Monnin**, Armelle Brun, and Davy Monticolo. "Treat Different Negatives Differently: Enriching Loss Functions with Domain and Range Constraints for Link Prediction". In: *The Semantic Web - 21st International Conference, ESWC 2024, Hersonissos, Crete, Greece, May 26 - 30, 2024, Proceedings*. URL: https://doi.org/10.48550/arXiv.2303.00286.

[9] Nicolas Hubert, **Pierre Monnin**, Mathieu d'Aquin, Davy Monticolo, and Armelle Brun. "PyGraft: Configurable Generation of Synthetic Schemas and Knowledge Graphs at Your Fingertips". In: *The Semantic Web - 21st International Conference, ESWC 2024, Hersonissos, Crete, Greece, May 26 - 30, 2024, Proceedings*. URL: https://doi.org/10.48550/arXiv.2309.03685.

[10] Rémi Felin, **Pierre Monnin**, Catherine Faron, and Andrea Tettamanzi. "An Algorithm Based on Grammatical Evolution for Discovering SHACL Constraints". In: *Genetic Programming - 27th European Conference, EuroGP 2024, Held as Part of EvoStar 2024, Aberystwyth, UK, April 3-5, 2024, Proceedings*. Vol. 14631. Lecture Notes in Computer Science. Springer, 2024, pp. 176–191. DOI: 10.1007/978-3-031-56957-9_11. URL: https://inria.hal.science/hal-04446252.

[11] Nicolas Hubert, Heiko Paulheim, **Pierre Monnin**, Armelle Brun, and Davy Monticolo. "Schema First! Learn Versatile Knowledge Graph Embeddings by Capturing Semantics with MASCHInE". In: *Proceedings of the 12th Knowledge Capture Conference 2023, K-CAP 2023, Pensacola, FL, USA, December 5-7, 2023*. ACM, 2023, pp. 188–196. DOI: 10.1145/3587259.3627550. URL: https://arxiv.org/pdf/2306.03659.pdf.

[12] Lucas Jarnac, Miguel Couceiro, and **Pierre Monnin**. "Relevant Entity Selection: Knowledge Graph Bootstrapping via Zero-Shot Analogical Pruning". In: *Proceedings of the 32nd ACM International Conference on Information and Knowledge Management, CIKM 2023, Birmingham, United Kingdom, October 21-25, 2023*. ACM, 2023, pp. 934–944. DOI: 10.1145/3583780.3615030. URL: https://arxiv.org/pdf/2306.16296.pdf.

[13] Nicolas Hubert, **Pierre Monnin**, Armelle Brun, and Davy Monticolo. "New Strategies for Learning Knowledge Graph Embeddings: The Recommendation Case". In: *Knowledge Engineering and Knowledge Management - 23rd International Conference, EKAW 2022, Bolzano, Italy, September 26-29, 2022, Proceedings*. Vol. 13514. Lecture Notes in Computer Science. Springer, 2022, pp. 66–80. DOI: 10.1007/978-3-031-17105-5_5.

[14] **Pierre Monnin**, Emmanuel Bresso, Miguel Couceiro, Malika Smaïl-Tabbone, Amedeo Napoli, and Adrien Coulet. "Tackling scalability issues in mining path patterns from knowledge graphs: a preliminary study". In: *Proceedings of the First International Conference "Algebras, graphs and ordered sets", ALGOS 2020, Online (originally planned in Nancy, France), August 26-28, 2020*. Vol. 2925. CEUR Workshop Proceedings. CEUR-WS.org, 2020, pp. 123–137. URL: http://ceur-ws.org/Vol-2925/paper5.pdf.

[15] **Pierre Monnin**, Mario Lezoche, Amedeo Napoli, and Adrien Coulet. "Using Formal Concept Analysis for Checking the Structure of an Ontology in LOD: The Example of DBpedia". In: *Foundations of Intelligent Systems - 23rd International Symposium, ISMIS 2017, Warsaw, Poland, June 26-29, 2017, Proceedings*. Vol. 10352. Lecture Notes in Computer Science. Springer, 2017, pp. 674–683. DOI: 10.1007/978-3-319-60438-1_66.

International workshops

[16] Mina Abd Nikooie Pour, Alsayed Algergawy, Patrice Buche, Leyla Jael Castro, Jiaoyan Chen, Adrien Coulet, Julien Cufi, Hang Dong, Omaima Fallatah, Daniel Faria, Irini Fundulaki, Sven Hertling, Yuan He, Ian Horrocks, Martin Huschka, Liliana Ibanescu, Sarika Jain, Ernesto Jiménez-Ruiz, Naouel Karam, Patrick Lambrix, Huanyu Li, Ying Li, **Pierre Monnin**, Engy Nasr, Heiko Paulheim, Catia Pesquita, Tzanina Saveta, Pavel Shvaiko, Guilherme Sousa, Cássia Trojahn, Jana Vatascinová, Mingfang Wu, Beyza Yaman, Ondrej Zamazal, and Lu Zhou. "Results of the Ontology Alignment Evaluation Initiative 2023". In: *Proceedings of the 18th International Workshop on Ontology Matching co-located with the 22nd International Semantic Web Conference (ISWC 2023), Athens, Greece, November 7, 2023*. Vol. 3591. CEUR Workshop Proceedings. CEUR-WS.org, 2023, pp. 97–139. URL: https://ceur-ws.org/Vol-3591/oaei23_paper0.pdf.

[17] Lucas Jarnac and **Pierre Monnin**. "Wikidata to Bootstrap an Enterprise Knowledge Graph: How to Stay on Topic?" In: *Proceedings of the 3rd Wikidata Workshop 2022 co-located with the 21st International Semantic Web Conference (ISWC2022), Virtual Event, Hanghzou, China, October 2022*. Vol. 3262. CEUR Workshop Proceedings. CEUR-WS.org, 2022. URL: https://ceur-ws.org/Vol-3262/paper16.pdf.

[18] Nicolas Hubert, **Pierre Monnin**, Armelle Brun, and Davy Monticolo. "Knowledge Graph Embeddings for Link Prediction: Beware of Semantics!" In: *Proceedings of the Workshop on Deep Learning for Knowledge Graphs (DL4KG 2022) co-located with the 21th International Semantic Web Conference (ISWC 2022), Virtual Conference, online, October 24, 2022*. Vol. 3342. CEUR Workshop Proceedings. CEUR-WS.org, 2022. URL: https://ceur-ws.org/Vol-3342/paper-4.pdf.

[19] **Pierre Monnin** and Adrien Coulet. "Matching Pharmacogenomic Knowledge: Particularities, Results, and Perspectives". In: *Proceedings of the 17th International Workshop on Ontology Matching (OM 2022) co-located with the 21th International Semantic Web Conference (ISWC 2022), Hangzhou, China, held as a virtual conference, October 23, 2022*. Vol. 3324. CEUR Workshop Proceedings. CEUR-WS.org, 2022, pp. 79–83. URL: https://ceur-ws.org/Vol-3324/om2022_STpaper3.pdf.

[20] **Pierre Monnin** and Miguel Couceiro. "Interactions Between Knowledge Graph-Related Tasks and Analogical Reasoning: A Discussion". In: *Workshop Proceedings of the 30th International Conference on Case-Based Reasoning co-located with the 30th International Conference on Case-Based Reasoning (ICCBR 2022), Nancy (France), September 12-15th, 2022*. Vol. 3389. CEUR Workshop Proceedings. CEUR-WS.org, 2022, pp. 57–67. URL: https://ceur-ws.org/Vol-3389/ICCBR_2022_Workshop_paper_75.pdf.

[21] Viet-Phi Huynh, Jixiong Liu, Yoan Chabot, Frédéric Deuzé, Thomas Labbé, **Pierre Monnin**, and Raphaël Troncy. "DAGOBAH: Table and Graph Contexts For Efficient Semantic Annotation Of Tabular Data". In: *Proceedings of the Semantic Web Challenge on Tabular Data to Knowledge Graph Matching co-located with the 20th International Semantic Web Conference (ISWC 2021), Virtual conference, October 27, 2021*. Vol. 3103. CEUR Workshop Proceedings. CEUR-WS.org, 2021, pp. 19–31. URL: http://ceur-ws.org/Vol-3103/paper2.pdf.

[22] Viet-Phi Huynh, Jixiong Liu, Yoan Chabot, Thomas Labbé, **Pierre Monnin**, and Raphaël Troncy. "DAGOBAH: Enhanced Scoring Algorithms for Scalable Annotations of Tabular Data". In: *Proceedings of the Semantic Web Challenge on Tabular Data to Knowledge Graph Matching (SemTab 2020) co-located with the 19th International Semantic Web Conference (ISWC 2020), Virtual conference (originally planned to be in Athens, Greece), November 5, 2020*. Vol. 2775. CEUR Workshop Proceedings. CEUR-WS.org, 2020, pp. 27–39. URL: http://ceur-ws.org/Vol-2775/paper3.pdf.

[23] **Pierre Monnin**, Chedy Raïssi, Amedeo Napoli, and Adrien Coulet. "Knowledge Reconciliation with Graph Convolutional Networks: Preliminary Results". In: *Proceedings of the Workshop on Deep Learning for Knowledge Graphs (DL4KG2019) Co-located with the 16th Extended Semantic Web Conference 2019 (ESWC 2019), Portoroz, Slovenia, June 2, 2019*. Vol. 2377. CEUR Workshop Proceedings. CEUR-WS.org, 2019, pp. 47–56. URL: http://ceur-ws.org/Vol-2377/paper_6.pdf.

[24] **Pierre Monnin**. "Discovering and Comparing Relational Knowledge, the Example of Pharmacogenomics". In: *Proceedings of the EKAW Doctoral Consortium 2018 co-located with the 21st International Conference on Knowledge Engineering and Knowledge Management (EKAW 2018), Nancy, France, November 13, 2018*. Vol. 2306. CEUR Workshop Proceedings. CEUR-WS.org, 2018. URL: http://ceur-ws.org/Vol-2306/paper5.pdf.

[25] **Pierre Monnin**, Amedeo Napoli, and Adrien Coulet. "Combining Concept Annotation and Pattern Structures for Guiding Ontology Mapping". In: *Proceedings of the 6th International Workshop "What can FCA do for Artificial Intelligence"? co-located with International Joint Conference on Artificial Intelligence and European Conference on Artificial Intelligence (IJCAI/ECAI 2018), Stockholm, Sweden, July 13, 2018*. Vol. 2149. CEUR Workshop Proceedings. CEUR-WS.org, 2018, pp. 117–126. URL: http://ceur-ws.org/Vol-2149/paper11.pdf.

[26] **Pierre Monnin**, Clément Jonquet, Joël Legrand, Amedeo Napoli, and Adrien Coulet. "PGxO: A very lite ontology to reconcile pharmacogenomic knowledge units". In: *Methods, tools & platforms for Personalized Medicine in the Big Data Era, NETTAB 2017, Palermo, Italy, October 16-18, 2017*. PeerJ Preprints, 2017. DOI: 10.7287/peerj.preprints.3140v1.

Posters, demos, and short papers in international conferences

[27] **Pierre Monnin**, Cherif-Hassan Nousradine, Lucas Jarnac, Laurel Zuckerman, and Miguel Couceiro. "KGPrune: a Web Application to Extract Subgraphs of Interest from Wikidata with Analogical Pruning". In: *ECAI 2024 - 27th European Conference on Artificial Intelligence, October 19-24, 2024, Santiago de Compostela, Spain*. Vol. (to appear). Frontiers in Artificial Intelligence and Applications. (demonstration). IOS Press, 2024. URL: https://inria.hal.science/hal-04678284.

[28] Rémi Felin, **Pierre Monnin**, Catherine Faron, and Andrea Tettamanzi. "RDFminer: an Interactive Tool for the Evolutionary Discovery of SHACL Shapes". In: *The Semantic Web: ESWC 2024 Satellite Events - Hersonissos, Crete, Greece, May 26 - May 30, 2024, Proceedings*. Vol. (to appear). (poster). 2024. URL: https://inria.hal.science/hal-04566981.

[29] Christophe Sarthou-Camy, Guillaume Jourdain, Yoan Chabot, **Pierre Monnin**, Frédéric Deuzé, Viet-Phi Huynh, Jixiong Liu, Thomas Labbé, and Raphaël Troncy. "DAGOBAH UI: A New Hope for Semantic Table Interpretation". In: *The Semantic Web: ESWC 2022 Satellite Events - Hersonissos, Crete, Greece, May 29 - June 2, 2022, Proceedings*. Vol. 13384. Lecture Notes in Computer Science. (demonstration). Springer, 2022, pp. 107–111. DOI: 10.1007/978-3-031-11609-4_20.

[30] Yoan Chabot, **Pierre Monnin**, Frédéric Deuzé, Viet-Phi Huynh, Thomas Labbé, Jixiong Liu, and Raphaël Troncy. "A Framework for Automatically Interpreting Tabular Data at Orange". In: *Proceedings of the ISWC 2021 Posters, Demos and Industry Tracks: From Novel Ideas to Industrial Practice co-located with 20th International Semantic Web Conference (ISWC 2021), Virtual Conference, October 24-28, 2021*. Vol. 2980. CEUR Workshop Proceedings. (extended industry abstract). CEUR-WS.org, 2021. URL: http://ceur-ws.org/Vol-2980/paper413.pdf.

[31] **Pierre Monnin**, Miguel Couceiro, Amedeo Napoli, and Adrien Coulet. "Knowledge-Based Matching of n-ary Tuples". In: *Ontologies and Concepts in Mind and Machine - 25th International Conference on Conceptual Structures, ICCS 2020, Bolzano, Italy, September 18-20, 2020, Proceedings*. Vol. 12277. Lecture Notes in Computer Science. (short paper). Springer, 2020, pp. 48–56. DOI: 10.1007/978-3-030-57855-8_4.

Abstracts of oral presentations in international conferences

[32] François-Élie Calvier, **Pierre Monnin**, Miguel Boland, Patryk Jarnot, Emmanuel Bresso, Malika Smaïl-Tabbone, Adrien Coulet, and Cedric Bousquet. "Providing Molecular Characterization for Unexplained Adverse Drug Reactions". Podium Abstract, MedInfo 2019, Lyon, France, August 26-30, 2019. URL: https://hal.inria.fr/hal-02196134.

Abstracts of oral presentations in international workshops

[33] Lucas Jarnac and **Pierre Monnin**. "Wikidata to Bootstrap an Enterprise Knowledge Graph: How to Stay on Topic?" Wiki Workshop (10th edition), May 11, 2023. URL: https://pmonnin.github.io/publications/jarnac-wikiworkshop-2023.pdf.

[34] **Pierre Monnin**, Amedeo Napoli, and Adrien Coulet. "Data-Interlinking: the Seed of Knowledge Reconciliation in Pharmacogenomics". Workshop Symbolic methods for data-interlinking co-located with the 21st International Conference on Knowledge Engineering and Knowledge Management (EKAW 2018), Nancy, France, November 13, 2018. URL: https://hal.inria.fr/hal-01955262.

National conferences

[35] Rémi Felin, **Pierre Monnin**, Catherine Faron, and Andrea Tettamanzi. "Extraction probabiliste de formes SHACL à l'aide d'algorithmes évolutionnaires". In: *Extraction et Gestion des Connaissances, EGC 2024, Dijon, France, 22 - 26 janvier 2024*. RNTI. Editions RNTI, 2024, pp. 143–154. URL: `https://inria.hal.science/hal-04411349/`.

[36] Viet-Phi Huynh, Jixiong Liu, Yoan Chabot, Frédéric Deuzé, Thomas Labbé, **Pierre Monnin**, and Raphaël Troncy. "DAGOBAH: Annotation sémantique de données tabulaires par comparaison du contexte des tables et d'un graphe de connaissances". In: *IC 2022 : 33es Journées francophones d'Ingénierie des Connaissances, Saint-Etienne, France, June 29 - July 1, 2022*. URL: `https://ci.mines-stetienne.fr/pfia2022/conferences/ic/Articles/S-1-Article-1.pdf`.

National workshops

[37] **Pierre Monnin**, Chedy Raïssi, Amedeo Napoli, and Adrien Coulet. "Combiner plongements de graphes et clustering pour l'alignement de connaissances pharmacogénomiques". In: *Santé & IA 2022 - Journée Santé et Intelligence Artificielle (Evènement affilié à PFIA 2022), Saint-Etienne, France, June 28, 2022*. URL: `https://hal.inria.fr/hal-03754776`.

Posters in national conferences

[38] **Pierre Monnin**, Joël Legrand, and Adrien Coulet. *PGxCorpus and PGxLOD: two shared resources for knowledge management in pharmacogenomics*. JOBIM 2022 - Journées Ouvertes en Biologie, Informatique et Mathématiques, Proceedings - Posters, Démos, Rennes, France, July 05-08, 2022. URL: `https://hal.inria.fr/hal-03754888`.

[39] **Pierre Monnin**, Amedeo Napoli, and Adrien Coulet. *Discovering Subsumption Axioms with Concept Annotation*. BDA 2017 - 33ème Conférence sur la Gestion de Données - Principes, Technologies et Applications, Nancy, France, November 14-17, 2017. URL: `https://hal.inria.fr/hal-01671454`.

Abstracts of oral presentations in national conferences

[40] Nicolas Hubert, **Pierre Monnin**, Mathieu d'Aquin, Davy Monticolo, and Armelle Brun. "PyGraft: un outil Python pour la génération de schémas et graphes de connaissance synthétiques". In: *IC 2024 : 35es Journées francophones d'Ingénierie des Connaissances, La Rochelle, France, July 3-5, 2024*. PFIA, 2024. URL: `https://inria.hal.science/hal-04589855`.

[41] Nicolas Hubert, **Pierre Monnin**, Armelle Brun, and Davy Monticolo. "Enrichissement de fonctions de perte avec contraintes de domaine et co-domaine pour la prédiction de liens dans les graphes de connaissance". In: *Conférence Nationale en Intelligence Artificielle, CNIA 2024, Annual French AI Conference, La Rochelle, France, July 3-5, 2024*. PFIA, 2024. URL: `https://inria.hal.science/hal-04566996`.

[42] Lucas Jarnac, Miguel Couceiro, and **Pierre Monnin**. "Relevant Entity Selection: Knowledge Graph Bootstrapping via Zero-Shot Analogical Pruning". 32èmes Rencontres Francophones sur la Logique Floue et ses Applications (LFA 2023), Bourges, France, November 9-10, 2023.

[43] Emmanuel Bresso*, **Pierre Monnin***, Cédric Bousquet, François-Élie Calvier, Ndeye Coumba Ndiaye, Nadine Petitpain, Malika Smaïl-Tabbone, and Adrien Coulet. *Investigating ADR mechanisms with Explainable AI: a feasibility study with knowledge graph mining*. JOBIM 2022 - Journées Ouvertes en Biologie, Informatique et Mathématiques, Proceedings - Keynotes, Contributed talks, Mini-Symposia, Rennes, France, July 05-08, 2022. URL: `https://hal.inria.fr/hal-03754898`.

Abstracts of oral presentations in national workshops

[44] Yoan Chabot, Thomas Labbé, and **Pierre Monnin**. *DAGOBAH : Des outils pour l'interprétation automatique de données tabulaires*. SemWeb.Pro 2021, Remote, December 9, 2021. URL: `https://2021.semweb.pro/presentations/dagobah/`.

Thesis

[45] **Pierre Monnin**. "Matching and mining in knowledge graphs of the Web of data - Applications in pharmacogenomics. (Appariement et fouille dans les graphes de connaissances du Web des données - Applications en pharmacogénomique)". PhD thesis. University of Lorraine, Nancy, France, 2020. URL: `https://tel.archives-ouvertes.fr/tel-03122326`.

Editorships

[46] Ulrike Sattler, Aidan Hogan, Maria Keet, Valentina Presutti, João Paulo A. Almeida, Hideaki Takeda, **Pierre Monnin**, Giuseppe Pirrò, and Claudia d'Amato, eds. *The Semantic Web - ISWC 2022 - 21st International Semantic Web Conference, ISWC 2022, Virtual Event, October 23-27, 2022, Proceedings.* Lecture Notes in Computer Science. Springer, 2022. DOI: 10.1007/978-3-031-19433-7.

[47] Miguel Couceiro, **Pierre Monnin**, and Amedeo Napoli, eds. *Proceedings of the First International Conference "Algebras, graphs and ordered sets", ALGOS 2020, Online (originally planned in Nancy, France), August 26-28, 2020.* Vol. 2925. CEUR Workshop Proceedings. CEUR-WS.org, 2021. URL: http://ceur-ws.org/Vol-2925.

Popularization articles

[48] **Pierre Monnin** and Adrien Coulet. "Projet ANR (2016-2021) " PractiKPharma " : extraction, comparaison et découverte de connaissances en pharmacogénomique". In: *1024 : Bulletin de la Société Informatique de France* 19 (Apr. 2022), pp. 109–120. DOI: 10.48556/sif.1024.19.109.

[49] **Pierre Monnin** and Adrien Coulet. "Étudier les mécanismes des effets indésirables des médicaments avec l'IA explicable : expériences avec la fouille de graphes de connaissances". In: *Bulletin de l'Association Française pour l'Intelligence Artificielle* 116 (Apr. 2022), pp. 37–40. URL: https://hal.inria.fr/hal-03669065.

Popularization oral presentations

[50] **Pierre Monnin**. "Using Wikidata to bootstrap a new knowledge graph: selecting relevant entities using analogical pruning". Wikidata Modelling Days 2023, Virtual Event, November 30, December 1-2, 2023. URL: https://www.youtube.com/watch?v=euXs8Jz4aeg.

Invited talks

International workshops

- **Pierre Monnin**. Discovering alignment relations with Graph Convolutional Networks: a biomedical case study. ROCED workshop at KGC 2022, May 2, 2022, Remote.

National conferences

- **Pierre Monnin**. Matching and mining in knowledge graphs of the Web of data - Applications in pharmacogenomics. EGC 2022 (best thesis award), January 24-28, 2022, Blois, France.

National workshops

- **Pierre Monnin**. Matching and mining in knowledge graphs of the Web of data - Applications in pharmacogenomics. DECADE workshop at PFIA 2022, June 28, 2022, Saint-Etienne, France.

- Yoan Chabot, **Pierre Monnin**. DAGOBAH : Activités de recherche Orange autour de l'annotation sémantique de données tabulaires. TextMine'21 workshop at EGC 2021, January 26, 2021, Montpellier, France, Remote.

Seminars, symposiums, and junior conferences

- **Pierre Monnin**. Aligning complex units in knowledge graphs - Symbolic and neuro-symbolic approaches for pharmacogenomics. ANR AGGREEY meeting, June 4, 2024, Sophia-Antipolis, France.

- **Pierre Monnin**. Neuro-symbolic approaches for the knowledge graph lifecycle. Università degli Studi di Bari Aldo Moro – Seminar of the PhD Program in Computer Science and Mathematics, January 30, 2024, Bari, Italy.

- **Pierre Monnin**. Neuro-symbolic approaches for the knowledge graph lifecycle. MALOTEC seminar, LORIA, December 18, 2023, Nancy, France.

- **Pierre Monnin**. Knowledge graphs and analogical reasoning: from the example of zero-shot KG bootstrapping to perspectives. Workshop on analogies : from learning to explainability (GT MHyIA & EXPLICON – GdR RADIA), November 27–28, 2023, Arras, France.

- **Pierre Monnin**. Knowledge graph construction, refinement, and applications, with a neuro-symbolic perspective. GT MHyIA meeting, March 29, 2023, Lens, France.

- **Pierre Monnin**. Knowledge graph construction, refinement, and applications, with a neuro-symbolic perspective. WIMMICS seminar, March 23, 2023, Sophia-Antipolis, France.
- **Pierre Monnin**. Knowledge graphs: construction, matching, and applications. CRIL seminar, January 12, 2023, Lens, France.
- **Pierre Monnin**. Knowledge graphs: construction, matching, and mining. 7th Junior Conference on Data Science and Engineering (JDSE 2022), September 15, 2022, Palaiseau, France.
- **Pierre Monnin**. Matching and mining in knowledge graphs of the Web of data - Applications in pharmacogenomics. 4th GdR MaDICS symposium, July 11, 2022, Lyon, France.
- **Pierre Monnin**. DAGOBAH - An End-to-End Context-Free Semantic Annotation System for Tabular Data. MALOTEC seminar, LORIA, February 4, 2021, Nancy, France, Remote.

Non-academic talks

- **Pierre Monnin**. Knowledge graphs: construction, refinement, and applications, with a neuro-symbolic perspective. Language & Cognition seminar, IDMC, Université de Lorraine, February 1, 2023, Nancy, France (∼30 people).
- Mathieu d'Aquin, Miguel Couceiro, **Pierre Monnin**. From machine learning to knowledge and back: A (de)tour over reasoning, analogies and knowledge graphs. Panel discussion. Cognitive Science and NLP forum of IDMC, Université de Lorraine, November 23, 2022, Nancy, France (∼30 people).
- **Pierre Monnin**. Presentation of my career. TELECOM Nancy career day, June 9, 2022, Nancy, France (∼75 people).
- **Pierre Monnin**. Valedictorian speech. TELECOM Nancy graduation ceremony, November 28, 2015, Nancy, France (∼300 people).

Teaching

Classes with (EN) were taught in English. Other classes were taught in French.

Summary

Year	Class	Level	Lecture	Tutorial	Practical	Resp.
2024 – 2025	AI for Applied Foreign Languages	M.Sc. Year 2	18			×
	AI for Applied Foreign Languages	M.Sc. Year 1	18			×
	AI for Adult Education	M.Sc. Year 1	24			×
	AI for preparatory classes for higher ed.	B.Sc. Year 1	3			×
	ML & Semantic Web	M.Sc. Year 2	1	1.5		×
	NoSQL Databases	M.Sc. Year 1	6	15		×
2023 – 2024	AI for Applied Foreign Languages	M.Sc. Year 1	12	12		×
	AI for Adult Education	M.Sc. Year 1	24			×
	AI for Marketing	B.Sc. Year 3	12			×
	AI for preparatory classes for higher ed.	B.Sc. Year 1	3			×
	ML & Semantic Web	M.Sc. Year 2	1	1.5		×
	Research project supervision	M.Sc. Year 2		6		
	XML	M.Sc. Year 1		12.5		
	Machine learning tutoring	M.Sc. Year 2		10		×
	Artificial Intelligence	M.Sc. Year 2	10	8		×
2022 – 2023	Knowledge-based systems	M.Sc. Year 2	4	4		×
2019 – 2020	Introduction to GNU/Linux and Git(EN)	M.Sc. Year 2		4		
	Ontologies(EN)	M.Sc. Year 2		6		
	Algorithms and programming	M.Sc. Year 1		15		
	Semantic Web(EN)	M.Sc. Year 1		15		
	Computability and Complexity(EN)	M.Sc. Year 1		10		
	Computational Complexity	B.Sc. Year 3	15	15		×
	Advanced Java Programming	B.Sc. Year 3		20		
	Java Programming	B.Sc. Year 2		20		
	Web Programming	B.Sc. Year 1		14		
	Algorithmics	B.Sc. Year 1		22		
	Tools and Digital Culture	B.Sc. Year 1		20		
2018 – 2019	Artificial Intelligence	M.Sc. Year 2		14	2	
	Knowledge-Based Systems	M.Sc. Year 2	16	16		×
	NoSQL Databases	M.Sc. Year 2			20	
	Compiler Implementation Project	M.Sc. Year 1			14	
2017 – 2018	Artificial Intelligence	M.Sc. Year 2	2	14	2	
	Knowledge-Based Systems	M.Sc. Year 2	16	16		×
	Compiler Implementation Project	M.Sc. Year 1			14	
2016 – 2017	Theory of Compilation	M.Sc. Year 1		20		
	Compiler Implementation Project	M.Sc. Year 1			14	
	Computer Science Basics	B.Sc. Year 3		18	16	
2015 – 2016	Compiler Implementation Project	M.Sc. Year 1			14	
	Total		**185h**	**329.5h**	**96h**	

A × in column "Responsibilities" (Resp.) means that I was in charge of the class (scheduling sessions, preparing subjects and handouts for lectures, tutorials, practicals, exams, and projects, coordination with other teachers, participation in examination boards).

Class descriptions

2024 – 2025 **Junior Fellow in AI – EFELIA Côte d'Azur – Nice, France**

Introduction to Artificial Intelligence for Applied Foreign Languages (M.Sc. Year 2)
Focus on Natural Language Processing, tasks, (past to modern) models, limits, and applications in professional settings

Introduction to Artificial Intelligence for Applied Foreign Languages (M.Sc. Year 1)
Introduction to Artificial Intelligence, Machine Learning, Deep Learning, training process, Neural Networks, evaluation, Natural Language Processing, and associated tasks

Introduction to Artificial Intelligence for Adult Education
Introduction to Artificial Intelligence, Machine Learning, Deep Learning, training process, Neural Networks, evaluation, Natural Language Processing, and associated tasks

Introduction to Artificial Intelligence for preparatory classes for higher education (CPES)
Introduction to Artificial Intelligence, Machine Learning, Deep Learning, training process, Neural Networks, evaluation, and associated tasks

Machine Learning & Semantic Web
Introduction to graph machine learning for knowledge graph refinement, some knowledge graph embedding models, link prediction, and evaluation

NoSQL Databases
MongoDB, Elasticsearch, Redis, HBase, Neo4J

2023 – 2024 **Junior Fellow in AI – EFELIA Côte d'Azur – Nice, France**

Introduction to Artificial Intelligence for Applied Foreign Languages
Introduction to Artificial Intelligence, Machine Learning, Deep Learning, training process, Neural Networks, evaluation, Natural Language Processing, and associated tasks

Introduction to Artificial Intelligence for Adult Education
Introduction to Artificial Intelligence, Machine Learning, Deep Learning, training process, Neural Networks, evaluation, Natural Language Processing, and associated tasks

Introduction to Artificial Intelligence for Marketing
Introduction to Artificial Intelligence, Machine Learning, Deep Learning, training process, Neural Networks, evaluation, Natural Language Processing, image generation, and associated tasks

Introduction to Artificial Intelligence for preparatory classes for higher education (CPES)
Introduction to Artificial Intelligence, Machine Learning, Deep Learning, training process, Neural Networks, evaluation, and associated tasks

Machine Learning & Semantic Web
Introduction to graph machine learning for knowledge graph refinement, some knowledge graph embedding models, link prediction, and evaluation

Research project supervision
Supervision of one master student for his research project

XML
XML language, DTD, XQuery, XSLT

Machine learning tutoring
Basics of Machine Learning, supervised and unsupervised learning, neural networks (MLP, CNN), training process, evaluation

2023 – 2024 **Temporary lecturer – TELECOM Nancy – Nancy, France**

Artificial Intelligence
Artificial Intelligence, supervised and unsupervised learning (*e.g.*, decision trees, neural networks, backpropagation algorithm, multilayer perceptron, K-means, Kohonen maps), Markov decision processes, knowledge graphs and the Semantic Web (RDF, ontologies, OWL reasoning, SPARQL), introduction to advanced AI techniques (e.g., CNN, GNN), applications & limits of AI, eXplainable AI, neuro-symbolic AI

2022 – 2023 **Temporary lecturer – TELECOM Nancy – Nancy, France**

Knowledge-based systems
Semantic Web (RDF, ontologies, OWL reasoning, SPARQL)

2019 – 2020 **Temporary teaching and research fellow – IDMC – Nancy, France**

Introduction to GNU/Linux and Git[(EN)]
Basics of Linux and Git commands

Ontologies[(EN)]
Description Logics, SPARQL

Algorithms and Programming
Introduction to programming in Python (functional and object-oriented programming)

Semantic Web[(EN)]
First-order logic, Description Logics, Formal Concept Analysis, itemsets, association rules, Knowledge Graphs, Semantic Web (RDF, SPARQL) and applications

Computability and Complexity[(EN)]
Turing machines, uncomputability, undecidability, complexity (*e.g.*, big O notation)

Computational Complexity
Best, worst, and average case complexity, sorting algorithms, recursion, de-recursion, randomized algorithms, greedy algorithms, dynamic programming, backtracking, data structures (stacks, queues, heaps, graphs)

Advanced Java Programming
Advanced concepts of the Java language (collections, threads, User Interface)

Java Programming
Basic concepts of the Java language and Object Oriented Programming

Web Programming
HTML, CSS, and an introduction to JavaScript

Algorithmics
Introduction to algorithms (variables, assignments, conditions, loops, subalgorithms)

Tools and Digital Culture
Proficient use of Word, Excel, and Internet Research

2016 – 2019 **Teaching assistant – TELECOM Nancy – Nancy, France**

Artificial Intelligence
Search algorithms (*e.g.*, A*, alpha-beta pruning), genetic algorithms, constraint satisfaction problems, Markov decision processes, supervised and unsupervised learning (*e.g.*, decision trees, neural networks, backpropagation algorithm, multilayer perceptron, K-means, Kohonen map)

Knowledge-Based Systems
Semantic Web (RDF, ontologies, OWL, SPARQL), Prolog

NoSQL Databases
MongoDB, Elasticsearch, Redis, HBase, Neo4J

Theory of Compilation
LR(0), SLR(1), LR(1) and LALR(1) parsers, Symbol Tables, Abstract Syntax Trees, assembly code generation

Compiler Implementation Project
Implementation of a compiler with ANTLR, from grammar definition to assembly code generation

Computer Science Basics
Sorting algorithms, complexity, recursivity, back-tracking, Hoare logic

2015 – 2016 **Temporary lecturer – TELECOM Nancy – Nancy, France**

Compiler Implementation Project
Implementation of a compiler with ANTLR, from grammar definition to assembly code generation