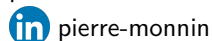


# Pierre Monnin

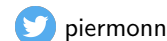
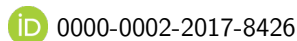
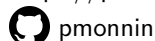
Techn Hom 3 - Orange Labs  
1, rue Maurice et Louis de Broglie  
90000 Belfort – France



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<https://pmonnin.github.io>



## Researcher in Artificial Intelligence

### Summary

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I am a researcher in Artificial Intelligence at Orange, in Belfort, France. I received my Doctoral degree in Computer Science from Université de Lorraine in 2020. My research focuses on knowledge discovery, matching, mining, and 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 am the Principal Investigator of the ECLADATTA project and Investigator of the AT2TA project (both funded by the French National Research Agency).

### Current positions

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Since Sept. 2020 **Researcher – Orange – Belfort, France**

Permanent Contract

Knowledge Engineering and Machine Learning for knowledge graph construction and refinement

Dec. 2022

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

8-hour class about knowledge-based systems

### Education

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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
  - Graph embedding and clustering-based approach with Graph Convolutional Networks
- Knowledge mining
  - Scalable mining of path patterns
  - Extension of Formal Concept Analysis for refinement of ontology class hierarchies
- Explainable AI
  - Interpretable features and models to reproduce expert classifications of drugs causing or not side effects (post-hoc explanations)
- Throughout all works: importance of domain knowledge represented in ontologies
- Applications on real data in pharmacogenomics:  $n$ -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

- 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

Supervisors: Amedeo Napoli et Adrien Coulet

Committee: Marianne Clausel (chair)

Claudia d'Amato, Fabien Gandon (reviewers)

Céline Rouveirol, Matthias Samwald (examiners)

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

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

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

2019 – 2020     **Temporary teaching and research fellow – IDMC – Nancy, France – ~192h of teaching**

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

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- Best paper award at the 23rd International Conference on Knowledge Engineering and Knowledge Management (EKAW 2022)
- Best paper award at the IC ("Ingénierie des connaissances" - Knowledge Engineering) 2022 conference co-located with PFIA 2022
- Best thesis award at EGC 2022, awarded by the French Association EGC ("Extraction et Gestion des connaissances" - Knowledge Extraction and Engineering)
- 1<sup>st</sup> prize (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)
- 3<sup>rd</sup> prize 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

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ECLADATTA (2023 – 2026)	<p><b>Principal Investigator</b> – French National Research Agency (ANR) Generic Call 2022</p> <p>I lead this 42-month project which aims at proposing a joint pipeline for extracting and reconciling knowledge from texts, tables, and knowledge graphs.</p> <p>Funding for my institution (Orange): 196k€ – Total project funding: 601k€</p> <p>Partners: EURECOM, IRIT, Orange</p>
AT2TA (2023 – 2026)	<p><b>Investigator</b> – French National Research Agency (ANR) Generic Call 2022</p> <p>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.</p> <p>Funding for my institution (Orange): 30k€ – Total project funding: 669k€</p> <p>Partners: LORIA (PI), IHU Imagine, IRIT, Inria, Infologic, Orange</p>

## Community services

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### Event organization activities

ISWC 2022	Proceedings & Metadata co-chair with Giuseppe Pirrò 21st International Semantic Web Conference ~ 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 ICCBR 2022 ~ 25 attendees
ALGOS 2020	General co-chair with Miguel Couceiro and Amedeo Napoli International conference on ALgebras, Graphs and Ordered Sets ~ 50 attendees

### Reviewing activities

- Journals
  - Journal of Web Semantics
  - Special Issue on Tools & Systems of the Semantic Web Journal (Guest Editorial Board member)
  - Communications Medicine
- Conferences
  - EKAW 2022 (additional reviewer)
  - MedInfo 2021 (reviewer)

- IJCAI 2019 (assistant reviewer)
- Workshops
  - DL4KG workshop, co-located with ISWC 2022 (Program Committee member)
  - IARML workshop, co-located with IJCAI-ECAI 2022 (Program Committee member)

## Miscellaneous

- Member of the “Cognitive AI” W3C Community Group

## Student supervision

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### PhD students

- From Dec. 2022 **Lucas Jarnac – Orange / Université de Lorraine**  
 Reconciliation of uncertain knowledge from heterogeneous sources for knowledge graph refinement  
 Co-supervised with Miguel Couceiro
- 2021 – ongoing **Nicolas Hubert – Université de Lorraine**  
 Even though I am not his supervisor, I have the chance of working with Nicolas on his thesis about knowledge graphs and explainable recommender systems for education

### Interns and student projects

- 2022 – 2023 **Omar Abdelkader, 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
- 2022 – 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
- 2022 – 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
- 2022 **Lucas Jarnac, M.Sc. Year 2 (Bac+5), 6-month internship**  
 Creation of an Enterprise Knowledge Graph: bootstrapping and knowledge reconciliation
- 2019 **Melvin Moreau, B.Eng. Year 2 (Bac+2), 2-month internship**  
 Updating PGxLOD with the newest versions of the integrated Linked Open Data sets  
 Co-supervised with Amedeo Napoli
- 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
- 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

## Available software and data

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- PGxLOD, a knowledge graph to integrate pharmacogenomic knowledge (<https://pgxlod.loria.fr>)
- PGxO, an ontology to represent pharmacogenomic knowledge (<https://pgxo.loria.fr>)
- Code of experiments on GitHub (<https://github.com/pmonnin>)

## Technical skills

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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

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

## Miscellaneous

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

## Publications

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### Selected publications

- **Pierre Monnin**, Chedy Rassi, 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 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 considering 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), which corresponds to the emergence of a semantics in the embedding space. This let us consider clustering and distances in the embedding space as a means to suggest alignment relations.*

- Emmanuel Bresso\*, **Pierre Monnin\***, Cédric Bousquet, François-Élie Calvier, Ndeye Coumba Ndiaye, Nadine Petitpain, Malika Smal-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

*This journal paper proposes to mine features from knowledge graphs and use them in white-box models (here, decision trees) to generate post-hoc explanations for binary classifications. Here, we mined PGxLOD and reproduce expert classification of drugs causing or not two types of side effects. We showed that features from knowledge graphs and decision trees allow to reproduce expert classifications with a fair fidelity. Additionally, a manual evaluation by 3 experts of the most discriminative features showed that they may provide molecular explanations for the occurrence of drug side effects.*

- **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 of the PGxLOD knowledge graph that integrates pharmacogenomic knowledge from the PharmGKB specialized database, the biomedical literature (automatic relation extraction from text), and some studies of Electronic Health Records of hospitals (manual representation). PGxLOD has become one main output of the ANR project PractiKPharma.*

- 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

*This conference paper investigates whether graph embedding approaches for link prediction can be used for recommendation tasks. Two specialized training strategies are proposed and evaluated. For the evaluation part, we introduce a new metric Sem@K that captures the ability of models to predict/recommend entities that are of the expected type.*

- **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. Springer, 2020, pp. 48–56. DOI: 10.1007/978-3-030-57855-8\_4

*This conference paper presents a symbolic matching approach. The mathematical formalism proposed is highly generic and adaptable. Indeed, it considers n-ary tuples (without constraints on the arity) whose arguments are sets of individuals. The matching is performed with 5 rules concluding on 5 different relatedness levels. Domain knowledge represented within ontologies is leveraged in two preorders to compare arguments while facing their heterogeneous representations.*

- Viet-Phi Huynh, Jixiong Liu, Yoan Chabot, Frédéric Deuzé, Thomas Labbé, **Pierre Monnin**, and Raphaël Troncy. “DAGOBAB: 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>

*This workshop paper presents the latest version of the DAGOBAB system developed at Orange. DAGOBAB semantically annotates tabular data (e.g., cells, columns) with elements of a knowledge graph (e.g., entities, classes, properties). Annotations allow to semantically interpret tabular data content and can support various applications, e.g., data set indexing and recommendation, knowledge graph or table completion. This system won the 1<sup>st</sup> prize in accuracy at the international challenge SemTab 2021 co-located with ISWC 2022.*

## List of publications

\* equivalent contributions

### International journals

- [1] **Pierre Monnin**, Chedy Rassi, 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.
- [2] Emmanuel Bresso\*, **Pierre Monnin\***, Cédric Bousquet, François-Élie Calvier, Ndeye Coumba Ndiaye, Nadine Petitpain, Malika Smal-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.
- [3] **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

- [4] 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.

- [5] 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. CEUR-WS.org, 2021. URL: <http://ceur-ws.org/Vol-2980/paper413.pdf>.
- [6] **Pierre Monnin**, Emmanuel Bresso, Miguel Couceiro, Malika Smal-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, On-line (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>.
- [7] **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. Springer, 2020, pp. 48–56. DOI: 10.1007/978-3-030-57855-8\_4.
- [8] **Pierre Monnin**, Mario Lezoeche, 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

- [9] Lucas Jarnac and **Pierre Monnin**. “Wikidata to Bootstrap an Enterprise Knowledge Graph: How to Stay on Topic?”. In: *Proceedings of the 3rd Wikidata Workshop (Wikidata 2022) co-located with the 21st International Semantic Web Conference (ISWC 2022), Hangzhou, China, October 24, 2022, moved online (to appear)*. URL: <https://pmonnin.github.io/publications/jarnac-wikidata-2022.pdf>.
- [10] 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 (DL4KG2022) co-located with the 21st International Semantic Web Conference (ISWC 2022), Hangzhou, China, October 24, 2022, moved online (to appear)*. URL: <https://hal.archives-ouvertes.fr/hal-03787512>.
- [11] **Pierre Monnin** and Adrien Coulet. “Matching Pharmacogenomic Knowledge: Particularities, Results, and Perspectives”. In: *Proceedings of the 17th International Workshop on Ontology Matching co-located with the 21st International Semantic Web Conference (ISWC 2022), Hangzhou, China, October 23, 2022, moved online (to appear)*. URL: <https://pmonnin.github.io/publications/monnin-om-2022.pdf>.
- [12] **Pierre Monnin** and Miguel Couceiro. “Interactions Between Knowledge Graph-Related Tasks and Analogical Reasoning: A Discussion”. In: *Proceedings of ICCBR Analogies’22: Workshop on Analogies: from Theory to Applications at ICCBR 2022, September 12, 2022, Nancy, France (to appear)*.
- [13] Viet-Phi Huynh, Jixiong Liu, Yoan Chabot, Frédéric Deuzé, Thomas Labbé, **Pierre Monnin**, and Raphaël Troncy. “DAGOBAB: 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>.
- [14] Viet-Phi Huynh, Jixiong Liu, Yoan Chabot, Thomas Labbé, **Pierre Monnin**, and Raphaël Troncy. “DAGOBAB: 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>.
- [15] **Pierre Monnin**, Chedy Rassi, 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](http://ceur-ws.org/Vol-2377/paper_6.pdf).

- [16] **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>.
- [17] **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>.
- [18] **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.

#### Demos in international conferences

- [19] Christophe Sarthou-Camy, Guillaume Jourdain, Yoan Chabot, **Pierre Monnin**, Frédéric Deuzé, Viet-Phi Huynh, Jixiong Liu, Thomas Labbé, and Raphaël Troncy. "DAGOBAB 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. Springer, 2022, pp. 107–111. DOI: 10.1007/978-3-031-11609-4\_20.

#### Abstracts of oral presentations in international conferences

- [20] 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

- [21] **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

- [22] Viet-Phi Huynh, Jixiong Liu, Yoan Chabot, Frédéric Deuzé, Thomas Labbé, **Pierre Monnin**, and Raphaël Troncy. "DAGOBAB: 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

- [23] **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

- [24] **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>.
- [25] **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

- [26] Emmanuel Bresso\*, **Pierre\* Monnin\***, Cédric Bousquet, François-Élie Calvier, Ndeye Coumba Ndiaye, Nadine Petitpain, Malika Smail-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

- [27] Yoan Chabot, Thomas Labbé, and **Pierre Monnin**. *Investigating ADR mechanisms with Explainable AI: a feasibility study with knowledge graph mining*. SemWeb.Pro 2021, Remote, December 9, 2021. URL: <https://2021.semweb.pro/presentations/dagobah/>.

## Thesis

- [28] **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

- [29] 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.
- [30] 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

- [31] **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.
- [32] **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>.

## Invited talks

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### Academic talks

- **Pierre Monnin**. Knowledge graphs: construction, matching, and mining. JDSE 2022 junior conference, 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**. 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.
- **Pierre Monnin**. Discovering alignment relations with Graph Convolutional Networks: a biomedical case study. ROCED workshop at KGC 2022, May 2, 2022, Remote.
- **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.
- **Pierre Monnin**. DAGOBAB - An End-to-End Context-Free Semantic Annotation System for Tabular Data. MALOTEC seminar, LORIA, February 4, 2021, Nancy, France, Remote.
- Yoan Chabot, **Pierre Monnin**. DAGOBAB : Activités de recherche Orange autour de l'annotation sémantique de données tabulaires. TextMine'21 workshop at EGC 2021, January 26, 2021, Montpellier, France, Remote.

## Non-academic talks

- **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 <sup>(EN)</sup> were taught in English. Other classes were taught in French.

## Summary

Year	Class	Level	Lecture	Tutorial	Practical	Resp.
2022 – 2023	Knowledge-based systems	M.Sc. Year 2	4	4		×
2019 – 2020	Introduction to GNU/Linux and Git <sup>(EN)</sup>	M.Sc. Year 2		4		
	Ontologies <sup>(EN)</sup>	M.Sc. Year 2		6		
	Algorithms and programming	M.Sc. Year 1		15		
	Semantic Web <sup>(EN)</sup>	M.Sc. Year 1		15		
	Computability and Complexity <sup>(EN)</sup>	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	
<b>Total</b>			<b>53h</b>	<b>263h</b>	<b>96h</b>	

A × in column “Responsibilities” (Resp.) means that I was in charge of the class (schedule and exam organization, coordination with other teachers, participation to examination boards).

## Class descriptions

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<sup>\(EN\)</sup>](#)

Basics of Linux and Git commands

[Ontologies<sup>\(EN\)</sup>](#)

Description Logics, SPARQL

[Algorithms and Programming](#)

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

#### [Semantic Web<sup>\(EN\)</sup>](#)

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

#### [Computability and Complexity<sup>\(EN\)</sup>](#)

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