

The Seminars on “Information Technology Outlook” – PhD Program in Computer Science and Mathematics



Pierre Monnin

Junior Fellow in
Artificial Intelligence
at Université Côte d'Azur, France

Tuesday January 27, 2025

15:00



Aula Goedel

Dept. of Computer Science

The Schema Strikes Back: Refining Knowledge Graphs with Neuro-Symbolic AI

Neuro-symbolic AI is sometimes regarded as the 3rd wave of AI, and aim to integrate symbolic and neural approaches to combine their strengths and address their respective limitations. Stemming from symbolic AI, knowledge graphs (KGs) have been proliferating in the Web of Data and constitute a rich repository of symbolic knowledge that can feed neuro-symbolic approaches. However, due to their size, they are generally manipulated with Machine Learning approaches such as knowledge graph embedding models (KGEMs), which often disregard their inherent semantics. In this talk, I will illustrate through two specific methods how KGs, and in particular their inferential schemata (i.e., ontologies), can be effectively leveraged in KGEMs to achieve more coherent and accurate predictions in a KG completion task. These findings underscore the need for diverse, knowledge-rich benchmark datasets to foster the development of neuro-symbolic approaches, and I will discuss how synthetic KG and ontology generators like PyGraft could provide a solution.

SHORT BIO: Pierre Monnin is a Junior Fellow in AI at Université Côte d'Azur, member of the Wimmics team. His research focuses on knowledge graphs, their lifecycle (construction, matching, refinement, mining, knowledge discovery), and their usage in downstream applications (e.g., recommender systems, explainable AI). In particular, he investigates interactions between domain knowledge in knowledge graphs and different forms of reasoning in a neurosymbolic perspective (e.g., injection of domain knowledge in Machine Learning models, analogical reasoning). His work involves both theoretical and applied perspectives, often in interdisciplinary settings (e.g., biomedical, educational domains). He was the Principal Investigator of the ECLADATTA project and he is an Investigator of the AT2TA project (both funded by the French National Research Agency).