Luisa Werner

PhD Candidate in Neuro-Symbolic Integration

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🎓 Education

PhD Candidate at Université Grenoble Alpes — 2020 – October 2024
Neuro-Symbolic Integration on Knowledge Graphs, supervised by Nabil Layaïda — *Grenoble, France*

Master of Science at Karlsruhe Institute of Technology — 2017 – 2020
Computer Science — *Karlsruhe, Germany*

Bachelor of Sciene at Karlsruhe Institute of Technology — 2013 – 2017
Economics Engineering — *Karlsruhe, Germany*

💼 Research

Knowledge Enhanced Graph Neural Networks 🔗 — June 2023
Python, Pytorch, Pytorch Geometric, Matplotlib, Weights&Biases — *Grenoble, France*
Developed the neuro-symbolic approach KeGNN which is stacks differentiable Knowledge Enhancement Layers onto Graph Neural Network models to incorporate prior knowledge into the decision making process.

[Accepted paper at the KBCG Workshop @IJCAI 2023]

What Does It Take to Reproduce Experiments? - Evidences from the Neuro-Symbolic Domain 🔗 — May 2023
Python, Pytorch, Pytorch Geometric, Matplotlib, Weights&Biases — *Grenoble, France*
Provided a progressive methodology of reproducing, replicating and expanding experiments of previous work to safely build upon it.

Scalable Knowledge Enhancement of Graph Neural Networks 🔗 — September 2022
Python, Pytorch, Pytorch Geometric, Matplotlib, Weights&Biases — *Grenoble, France*
Extended the concepts of Knowledge Enhanced Neural Networks to large-scale graphs from the Open Graph Benchmark by developing and applying solutions to avoid the memory complexity problem of neighborhood explosion on large graphs.

Predictive Analytics by Inferring Structure from Electronic Health Records 🌐 — November 2019 - March 2020
Python, Tensorflow, Keras, Numpy, SQL — *Grenoble, France*
Research intern supervised by Pierre Genevès (Tyrex, INRIA) and Paula Breitling (TECO, KIT)

Applied Graph Convolutional Transformer to find structural embeddings of electronic health records to conduct mortality prediction

Econometric Analysis of RECIPROC® in Endodontics 🌐 — October – March 2016
R, Excel — *Karlsruhe, Germany*
Bachelorthesis, supervised bei Dr. Prof. Melanie Schienle (ECON, KIT) Analysed the

Studied statistically the efficacy of the RECIPROC® treatment method based on historical patient data.

[Published paper: Bartols A, Bormann C, Werner L, Schienle M, Walther W, Dörfer CE. 2020. A retrospective assessment of different endodontic treatment protocols. PeerJ 8:e8495]

💼 Work Experience

Deutsche Bundesbank (German Central Bank) — November 2018 – March 2019
Python, SQL — *Frankfurt, Germany*
Supported the development of a financial database with machine learning applications for data preprocessing and cleaning.

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💬 Talks and Attended Conferences

Talk at PhD Forum of ECML-PKDD | September 2022
on Neuro-Symbolic Integration on Knowledge Graphs | *Grenoble, France*

AI4Health Winter School | January 2022
organized by 3AI Institute, MIAI, PRAIRIE | *online*

Talk at Toulouse 3AI Workshop | November 2021
on Neuro-Symbolic Integration - Bridging the Gap between Neural Networks and Logic | *Toulouse, France*

Learning On Graphs Conference (LOG) | November 2021
LoG is an annual research conference that covers area related to machine learning on graphs and geometry. | *online*

When Deep Learning Meets Logic - A workshop on Neuro-Symbolic Integration | February 2021
organized by Samsung Research AI Center Cambridge | *online*

🏆 Awards and Scholarships

Best Second Year PhD Presentation @ MIAI Days | December 2022
MIA (Multidisciplinary Institute of Articificial Intelligence)

Scholar of Bosch Female Talents @ KIT | 2018 – 2019
A scholarship of the company Bosch, which supports excellent female students in MINT study courses
at Karlsruhe Institute of Technology with a mentoring program for their career development.

Scholar of Konrad Adenauer Stiftung | 2014 – 2020
A German scholarship providing career development, mentoring and financial support for outstanding students

⚙ Skills

Research Interests   Neuro-Symbolic Integration, Knowledge Graphs, Graph Neural Networks, Ontologies, Fuzzy Logic

Programming Languages   Python, R, SQL, Java, HTML

Deep Learning Frameworks   PyTorch, PyTorch Geometric, Tensorflow, Keras, Numpy, Matplotlib, Weights&Biases, Jupyter

Languages   Fluent in English, German and French

🔗 Other Achievements

Female Winner of the Atlas Mountain Race | February 2023
The Atlas Mountain Race is a 1300km long self-supported bikepacking race through the Atlas Mountains
in Marokko. The riders complete a challenging mountain bike course as fast as possible

7th at the U23 World Rowing Championshipsg | September 2016
Boat category Lightweight Women Single Scull

Bronze Medal at the U23 World Rowing Championships | July 2015
Boat category Lightweight Womens Quadruple Scull