

Luisa Werner

PhD Candidate in Neuro-Symbolic Integration

 /LuisaWerner

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 /luisa-werner

Education

PhD Candidate at Université Grenoble Alpes & INRIA

Neuro-Symbolic Integration on Knowledge Graphs, supervised by Nabil Layaïda

2020 – December 2024
Grenoble, France

Master of Science at Karlsruhe Institute of Technology

Computer Science

2017 – 2020
Karlsruhe, Germany

Bachelor of Science at Karlsruhe Institute of Technology

Economics Engineering

2013 – 2017
Karlsruhe, Germany

Research

Knowledge Enhanced Graph Neural Networks

Python, Pytorch, Pytorch Geometric, Matplotlib, Weights&Biases

Developed the neuro-symbolic approach KeGNN which stacks differentiable Knowledge Enhancement Layers onto Graph Neural Networks to incorporate prior knowledge into the decision making process

[Accepted paper the KBCG Workshop @IJCAI 2023]

June 2023
Grenoble, France

What Does It Take to Reproduce Experiments? - Evidences from the Neuro-Symbolic Domain

Python, Pytorch, Pytorch Geometric, Matplotlib, Weights&Biases

Provided a progressive methodology of reproducing, replicating and expanding experiments of previous work in order to safely build upon it

May 2023
Grenoble, France

Scalable Knowledge Enhancement of Graph Neural Networks

Python, Pytorch, Pytorch Geometric, Matplotlib, Weights&Biases

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

September 2022
Grenoble, France

Predictive Analytics by Inferring Structure from Electronic Health Records

Python, Tensorflow, Keras, Numpy, SQL

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 enhance mortality prediction

November 2019 - March 2020
Grenoble, France

Econometric Analysis of RECIPROC® in Endodontics

R, Excel

Bachelorthesis, supervised bei Dr. Prof. Melanie Schienle (ECON, KIT)

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]

October – March 2016
Karlsruhe, Germany

Work Experience

Deutsche Bundesbank (German Central Bank)

Python, SQL

Supported the development of a financial database with machine learning applications for data preprocessing and cleaning

November 2018 – March 2019
Frankfurt, Germany

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Talks and Attended Conferences

Talk at PhD Forum of ECML-PKDD

on Neuro-Symbolic Integration on Knowledge Graphs

September 2022
Grenoble, France

AI4Health Winter School

organized by 3AI Institute, MIAI, PRAIRIE

January 2022
online

Talk at Toulouse 3AI Workshop

on Neuro-Symbolic Integration - Bridging the Gap between Neural Networks and Logic

November 2021
Toulouse, France

Learning On Graphs Conference (LOG)

LoG is an annual research conference that covers areas related to machine learning on graphs and geometry.

November 2021
online

When Deep Learning Meets Logic - A workshop on Neuro-Symbolic Integration

organized by Samsung Research AI Center Cambridge

February 2021
online

Awards and Scholarships

Best Second Year PhD Presentation @ MIAI Days

MIA (Multidisciplinary Institute of Artificial Intelligence)

December 2022

Scholar of Bosch Female Talents @ KIT

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.

2018 – 2019

Scholar of Konrad Adenauer Stiftung

A German scholarship providing career development, mentoring and financial support for outstanding students

2014 – 2020

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

The Atlas Mountain Race is a 1300 km long self-supported bikepacking race through the Atlas Mountains in Morocco. The riders complete a challenging mountain bike course as fast as possible.

February 2023

7th at the U23 World Rowing Championships

Boat category Lightweight Women Single Scull

September 2016

Bronze Medal at the U23 World Rowing Championships

Boat category Lightweight Women Quadruple Scull

July 2015