

# Lukas Gosch

18/5/1993 | Citizenship: Austrian

Elvirastraße 21, 80636 Munich, Germany  
gosch.lukas@gmail.com | Web |  |  |  |  | +49 151 20230658



## EDUCATION

### PHD MACHINE LEARNING

TECHNICAL UNIVERSITY OF MUNICH

January 2022 - now

- Topic: Reliable AI for Structured Data
- Supervised by Prof. Stephan Günnemann

### MSC COMPUTATIONAL SCIENCE

UNIVERSITY OF VIENNA

March 2018 - July 2021

- Focus: Machine Learning and Optimization
- Performance scholarship
- Price for best Master's thesis
- GPA: 1.0 (1 best, 5 worst)

### BSC TECHNICAL PHYSICS

TECHNICAL UNIVERSITY OF VIENNA

September 2013 - September 2017

- Bachelor's thesis on a C++ data analysis project in high energy physics
- GPA: 1.9 (1 best, 5 worst)

### HIGHER SCHOOL CERTIFICATE

HTL ST. PÖLTEN, DEPARTMENT OF INFORMATICS

September 2007 - June 2012

- Focus on application programming in Java
- GPA: 1.0 (1 best, 5 worst)

## TEACHING

### TECHNICAL UNIVERSITY OF MUNICH

SUPERVISOR FOR MASTER'S THESES

- *Training Node-Level Differentially Private Graph Neural Networks with Random Walks*
- *Learnable Diffusion for Improved Structural Robustness of Graph Neural Networks*

COURSE INSTRUCTOR

- Machine Learning (ML) for Graphs and Sequential Data (2022S)
  - Responsible for Unit about Robust ML

### UNIVERSITY OF VIENNA

TUTOR | FEBRUARY 2019 - SEPTEMBER 2019

- Master course: Foundations of Data Analysis

### TECHNICAL UNIVERSITY OF VIENNA

TUTOR | OCTOBER 2016 - FEBRUARY 2019

- Computing for Physicists, Laboratory I/II/III

## RESEARCH EXPERIENCES

### MACHINE LEARNING

#### TECHNICAL UNIVERSITY OF MUNICH

PHD STUDENT, DATA ANALYTICS AND MACHINE LEARNING GROUP

January 2022 - now | Munich, Germany

Basic research on the mathematical and algorithmic foundations of reliable graph machine learning

Research Topics:

- Robustness of Deep (Graph) Learning
- Privacy-Preserving (Graph) Machine Learning

#### INSTITUTE OF SCIENCE & TECHNOLOGY AUSTRIA

RESEARCH INTERNSHIP, MACHINE LEARNING AND COMPUTER VISION GROUP

October 2019 - April 2020 | Vienna, Austria

Basic research in machine learning | Technical Report

- Information-theoretic approaches for deep self-supervised representation learning

#### FRAUNHOFER INSTITUTE FOR ALGORITHMS & SCIENTIFIC COMPUTING

RESEARCH INTERNSHIP, NUMERICAL DATA DRIVEN PREDICTION RESEARCH GROUP

July 2018 - September 2018 | Bonn, Germany

Python - Machine learning in cyber-physical systems

- Topological data analysis applied to time series

#### QUEEN'S UNIVERSITY BELFAST

RESEARCH INTERNSHIP, SCHOOL OF PSYCHOLOGY

July 2017 - August 2017 | Northern Ireland, UK

Matlab - Ball trajectory reconstruction from 3D markers

### OPTIMIZATION

#### AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

MASTER THESIS, INTEGRATED TRANSPORT OPTIMIZATION

July 2020 - June 2021 | Vienna, Austria

Combinatorial optimization applied in green logistics

- Mathematical modelling introducing a novel network design problem
- Exact and heuristic solving using integer linear programming and hybrid heuristics (C++)
- Presented and published at the IPIC2021 conference
- Won price for best Master's thesis from the Austrian Society of Operations Research (ÖGOR)

2008 - 2018 | Further employments

## SOFTWARE

### DEEPNOG

Open source software tool leveraging a deep convolutional neural network for protein similarity search.

- Published in Bioinformatics
- Link: <https://github.com/univieCUBE/deepnog>

Developed during a study-project in the Computational Systems Biology research group at the University of Vienna.

### GTTP-DATA

Dataset of real transportation infrastructure in the Danube Region. Instances and instance generator for the generalized tactical transportation problem.

- Data and instances used in IPIC2021 publication
- Link: <https://github.com/saper0/gttp-data>

Developed for my Master's thesis work.

## PUBLICATIONS

### 2021

Lukas Gosch, Matthias Prandtstetter, Karl F. Doerner  
On Modelling and Solving Green Collaborative Transportation Planning  
Proceedings of the 8th International Physical Internet Conference (IPIC2021)

### 2020

Roman Feldbauer, Lukas Gosch, Lukas Lüftinger, Patrick Hyden, Arthur Flexer, Thomas Rattei  
DeepNOG: fast and accurate protein orthologous group assignment  
Bioinformatics

## REFERENCES

### AFTER REQUEST

## FURTHER ACTIVITIES

### CONFERENCES

#### SPEAKER

- IPIC 2021 (Master's thesis work)
- 66th Annual Meeting of the Austrian Physical Society (Bachelor's thesis work)

#### PARTICIPANT

- ICLR 2022
- ICLR 2021
- VWCO18
- ALGO 2017 (Volunteer)

### SUMMER SCHOOLS

#### DEEP|BAYES - SUMMER SCHOOL

National Research University - Higher School of Economics, Moscow; August 2019

- Topics: Deep Learning and Bayesian Statistics

### ATTENDING OF LECTURES AND EVENTS

#### ON PHILOSOPHY, ETHICS AND MACHINE LEARNING

Examples

- Ethics & Bias in AI - Vienna Deep Learning Meetup
- Philosophy courses - University of Vienna

### BOOK CLUBS

#### SCIENTIFIC WRITING | 2019 - 2020

- With colleagues from IST Austria

#### CLASSIC LITERATURE & PHILOSOPHY | 2017 - 2021

- Founder
- Book list: <https://saper0.github.io/lesekreis/>

## SKILLS

### PROGRAMMING

Most experienced with:

- Python (PyTorch, scikit-learn, NumPy, matplotlib)
- C++
- $\text{\LaTeX}$

Some experience with:

- Java, R, Matlab, C, SQL
- Git, CPLEX, Linux

### LANGUAGES

GERMAN | NATIVE

ENGLISH | ADVANCED (LEVEL C1)

- IELTS band score 8