Lukas Gosch

18/5/1993 | Citizenship: Austrian

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EDUCATION

MSC COMPUTATIONAL SCIENCE
University of Vienna
March 2018 - July 2021 (expected)
- Focus: Machine Learning and Optimization
- Performance scholarship
- GPA: 1.0 (1 best, 5 worst)

Deep|Bayes - Summer School
National Research University - Higher School of Economics, Moscow; August 2019
- Topics: Deep Learning and Bayesian Statistics

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)

COURSEWORK
MACHINE LEARNING
- Statistical Machine Learning (IST Austria)
  - PhD level course
- Deep Learning
  - From the Mathematics master's program
- Softwareproject Bioinformatics
  - Designed a novel neural network architecture leading to a publication in Bioinformatics
  - PyTorch: Open source software tool
- Foundations of Data Analysis
  - Worked through substantial parts of Bishop's *Pattern Recognition and Machine Learning*
  - Introduction to unsupervised learning

OTHER
- Algorithms and Datastructures I+II (TU Wien)
- Bayesian Statistics (TU Wien)
- Numerical Methods I-IV
- Computational Optimization
- Mathematical Programming (TU Wien)
- Self-Organising Systems (TU Wien)

WORK EXPERIENCE

MACHINE LEARNING
IST AUSTRIA
Research Internship, Machine Learning and Computer Vision Group
October 2019 - April 2020 | Vienna, Austria
Basic research in machine learning | Technical Report
- Better understanding of deep self-supervised representation learning using information-theoretic approaches
- Exposing limits and biases in neural mutual information estimation; proposing a new method to overcome these
- Extensive experiments using PyTorch and Sacred

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

TEACHING
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

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

SKILLS

PROGRAMMING
Most experienced with:

- Python (PyTorch, scikit-learn, NumPy, matplotlib)
- C++
- LaTeX

Some experience with:

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

LANGUAGES
German | Native
English | Advanced (Level C1)

- IELTS band score 8

FURTHER ACTIVITIES

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

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

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

REFERENCES

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