

Jan Sobotka

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EDUCATION

Swiss Federal Institute of Technology in Lausanne (EPFL)

M.S. in Computer Science

Sep. 2024 – ongoing

Lausanne, CH

- Anticipated graduation date: 07/26

Czech Technical University, Faculty of Information Technology

B.S. in Informatics, Specialization in Artificial Intelligence

July 2021 – July 2024

Prague, CZ

- Weighted grade average: **1.05** (scale of 1.0 to 4.0, 1.0 is the best)
- Ranked among the **top 5%** of students in the majority of courses.

INDUSTRY EXPERIENCE

AI/ML Engineer Junior

Generali Česká pojišťovna

June 2021 – June 2023

Prague, CZ

- Prepared a machine learning pipeline that improved the accuracy of product recommendations by **~35%**.
- Built computing infrastructure for the company's internal data science community with over 90 members.
- Applied deep learning to product and text recommendation, client departure prediction, email classification, and unsupervised customer segmentation.

IT Generalist

Startup Disrupt

Feb. 2020 – June 2021

Prague, CZ

- Led the development of a web application for ticket sales.
- Deployed several websites and cloud services on AWS.
- Prepared IT setup for over 30 offline/online events.

Junior DevOps Intern

Cloudinfrastack

July 2020 – Sep. 2020

Prague, CZ

- Built server-side applications in Golang.
- Deployed several custom automation services.

RESEARCH EXPERIENCE

Research Assistant at the MLBio Lab

Swiss Federal Institute of Technology in Lausanne (EPFL)

Aug. 2024 – ongoing

Lausanne, CH

- Exploring the use of representation spaces of multimodal foundation models for unsupervised transfer learning.
- Developing algorithms for robust out-of-distribution generalization of computer vision models.
- Supervised by Prof. Maria Brbić.

Research Intern at the Computational Systems Neuroscience Group

Faculty of Mathematics and Physics, Charles University

Sep. 2023 – Aug. 2024

Prague, CZ

- Worked on deep learning-based decoding of neural activity for use in brain-machine interfaces.
- Bachelor thesis titled *Decoding visual stimuli from cortical activity using neural networks* [PDF 📄].
- Supervised by Mgr. Ján Antolík, Ph.D.

Research Assistant at the Data Science Lab

Faculty of Information Technology, Czech Technical University

Apr. 2023 – Feb. 2024

Prague, CZ

- Investigated the inner workings and applicability of optimization methods known as *Learning-to-Optimize* (meta-learning) and *fractional gradient descent* in the context of deep learning.

Computational Neuroscience Research Intern




Biozentrum, University of Basel

July 2023 – Sep. 2023



Basel, CH

- Worked on the research project *Bistable Dendrites Matter: Auto-Associative Memory in Networks of Neurons* under the supervision of Dr. Everton Agnes.
- Designed computational models of spiking neural networks and analyzed the role of bistable dendrites in memory.

PUBLICATIONS

- Jan Sobotka**, Petr Šimánek, Pavel Kordík (2024). Submitted
Enhancing Fractional Gradient Descent with Learned Optimizers.
Optimization Letters.
- Jan Sobotka**, Petr Šimánek, Daniel Vašata (2024). DOI  | arXiv 
Investigation into the Training Dynamics of Learned Optimizers.
The 16th International Conference on Agents and Artificial Intelligence (ICAART 2024).
- Jan Sobotka**, Petr Šimánek (2024). DOI 
Investigation into the Training Dynamics of Learned Optimizers (Student Abstract).
The 38th Annual AAAI Conference on Artificial Intelligence (AAAI-24).



SELECTED PROJECTS

- Auxiliary Training Objectives in Reinforcement Learning** Sep. 2024 – ongoing
 - Semester research project at the intersection of ML interpretability and reinforcement learning (RL).
 - Investigating the impact of auxiliary objectives on representations learned by recurrent neural networks serving as backbones for RL agents.
- Deep Reinforcement Learning for Optimal Experimental Design in Biology** Jan. 2023 – June 2023
 - Open research project focused on the efficient estimation of biological system parameters [OpenBioML ].
 - Implemented the TD3 RL algorithm and designed a pipeline for experiments on an HPC cluster.
- Generative Models of Regulatory DNA Sequences Based on Diffusion Models** July 2022 – Dec. 2022
 - Open research project investigating the application of diffusion models to genomics data [OpenBioML ].
 - Prepared data preprocessing and unit testing for the pipeline.
 - Initiated experimental research focused on exploring the synergy between diffusion models and hypernetworks.

EXTRACURRICULAR ACTIVITIES

- Participant of the ROBOT ICT Summer Academy** Aug. 2021 – Aug. 2021
 - Acquired hands-on experience with Robotic Process Automation (RPA) development using UiPath.
- Organizer of the Traion Community of Student Entrepreneurs** June 2020 – Feb. 2021
 - Organized offline meetings, educational seminars, and workshops targeted at startups and entrepreneurship.
- Volunteer for an Entrepreneurship Education Program for Students** Dec. 2019 – Aug. 2020
 - Organized events and wrote a technology/entrepreneurship blog for the Soutěž and Podnikej organization.
- Pitcher at the Czech Republic National Baseball Team U-15** Jan. 2017 – July 2017
 - Secured third place at the U-15 European Baseball Championship 2017.

HONORS AND AWARDS

The Bakala Foundation Scholarship: Awarded to 12 out of 165 applicants | The Bakala Foundation  | 2024
Merit-Based Scholarship for Academic Achievements: Czech Technical University | 2021, 2022, 2023
National Benchmark Exam in Mathematics: Scored higher than 97% of the 875 test takers | SCIO  | 2021
Algorithms & Programming Competition FIKS: 4th out of 107 contestants | Czech Technical University | 2020
TOP25 Czech High School Students of the Year 2020: Selection based on extracurricular activities | 2020

SKILLS

Programming languages: Python, C, C++, Julia, JavaScript, Go
Other selected technologies: PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib, Azure, AWS, Git, Docker, Bash
Languages: Czech (native speaker), English (C1, TOEFL iBT 107), German (A2)