Jan Sobotka

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Education

Swiss Federal Institute of Technology in Lausanne (EPFL) Sep. 2024 – ongoing
M.S. in Computer Science *Lausanne, CH*

Czech Technical University, Faculty of Information Technology July 2021 – July 2024
B.S. in Informatics, Specialization in Artificial Intelligence *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.

Work Experience

AI/ML Engineer Junior June 2021 – June 2023
Generali Česká pojišťovna *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 approaches to various projects, including product and text recommendation, client departure prediction, email classification, and unsupervised customer segmentation.

IT Generalist Feb. 2020 – June 2021
Startup Disrupt *Prague, CZ*

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

Junior DevOps Intern July 2020 – Sep. 2020
Cloudinfrastack *Prague, CZ*

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

Research Experience

Research Scholar at the MLBio Lab Aug. 2024 – ongoing
Swiss Federal Institute of Technology in Lausanne (EPFL) *Lausanne, CH*

- Using reinforcement learning for discovery of gene markers and fine-grained classes in single-cell data.
- Supervised by Prof. Maria Brbić.

Research Intern at the Computational Systems Neuroscience Group Sep. 2023 – ongoing
Faculty of Mathematics and Physics, Charles University *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* under the supervision of Mgr. Ján Antolík, Ph.D. and his Ph.D. student Luca Baroni.

Research Assistant at the Data Science Lab Apr. 2023 – Feb. 2024
Faculty of Information Technology, Czech Technical University *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 July 2023 – Sep. 2023
Biozentrum, University of Basel *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, Daniel Vašata (2024). DOI | Preprint
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

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.

Reinforcement Learning with Deep Q-Learning (Highway Driver Environment) Jan. 2021 – Feb. 2021

- Implemented deep Q-learning for autonomous driving in a self-made game environment.

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