

# Jan Sobotka

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## EDUCATION

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- Swiss Federal Institute of Technology in Lausanne (EPFL)** Sep. 2024 – ongoing  
*M.S. in Computer Science* Lausanne, CH
- Anticipated graduation date: 07/26
- 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.

## INDUSTRY EXPERIENCE

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- 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 to product and text recommendation, client departure prediction, email classification, and unsupervised customer segmentation.
- IT Generalist** Feb. 2020 – June 2021  
*Startup Disrupt* 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** July 2020 – Sep. 2020  
*Cloudinfrastack* Prague, CZ
- Built server-side applications in Golang.
  - Deployed several custom automation services.




## RESEARCH EXPERIENCE

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- Research Assistant at the MLBio Lab** Aug. 2024 – ongoing  
*Swiss Federal Institute of Technology in Lausanne (EPFL)* Lausanne, CH
- Developing algorithms for robust out-of-distribution generalization of computer vision models.
  - Exploring the application of reinforcement learning to simultaneous clustering and feature selection.
  - Supervised by Prof. Maria Brbić.
- Research Intern at the Computational Systems Neuroscience Group** Sep. 2023 – Aug. 2024  
*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* [PDF 📄].
  - Supervised by Mgr. Ján Antolík, Ph.D.
- 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

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- 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 AAI Conference on Artificial Intelligence (AAAI-24)*.

## SELECTED PROJECTS

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- Internal World Models in Recurrent Model-Free Reinforcement Learning** Sep. 2024 – ongoing
  - Ongoing semester research project at the intersection of ML interpretability, RL, and cognitive science.
  - Using methods from ML interpretability and neuroscience to understand the impact of auxiliary objectives in RL.
- 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

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- 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

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**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

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**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)