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*

- Weighted grade average: **5.89** (scale of 1.0 to 6.0, 6.0 is the best)
- Anticipated graduation date: 08/26

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

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.
- Managed IT setup and support for over 30 offline and online events.

Research Experience

Research Assistant at the Autonomous Systems Group July 2025 – ongoing
University of Texas at Austin, Oden Institute for Computational Engineering and Sciences *Austin, US*

- Analyzing large language models in strategy games using mechanistic interpretability and game theory.
- Supervised by Prof. Ufuk Topcu.

Research Assistant at the MLBio Lab Aug. 2024 – July 2025
Swiss Federal Institute of Technology in Lausanne (EPFL) *Lausanne, CH*

- Designed a framework to improve model robustness against distribution shifts by dynamically weighting an ensemble of weak supervisors, outperforming baselines by over 40% [2].
- Evaluated in-context learning capabilities of multimodal foundation models on computer vision tasks.
- 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*

- Developed a state-of-the-art method for decoding high-fidelity images from neural population activity [1].
- 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*

- Analyzed training dynamics of optimization methods known as *Learning-to-Optimize* (meta-learning) and *fractional gradient descent* [4, 5, 6].

Computational Neuroscience Research Intern July 2023 – Sep. 2023
Biozentrum, University of Basel *Basel, CH*

- Designed computational models of spiking neural networks and analyzed the role of bistable dendrites in memory (research project: *Bistable Dendrites Matter: Auto-Associative Memory in Networks of Neurons*).

Publications

* denotes equal contribution

[1] MEIcoder: Decoding Visual Stimuli from Neural Activity by Leveraging Most Exciting Inputs. [PDF]
Jan Sobotka, Luca Baroni, Ján Antolík.
*Neural Information Processing Systems (**NeurIPS 2025**).*

[2] Weak-to-Strong Generalization under Distribution Shifts. [PDF]
Myeongho Jeon*, **Jan Sobotka***, Suhwan Choi*, Maria Brbić.
*Neural Information Processing Systems (**NeurIPS 2025**).*

[3] Reverse-Engineering Memory in DreamerV3: From Sparse Representations to Functional Circuits. [PDF]
Jan Sobotka, Auke Ijspeert, Guillaume Bellegarda.
*Neural Information Processing Systems (**NeurIPS 2025, Spotlight at Mech Interp Workshop**).*

[4] Do LLMs Strategically Reveal, Conceal, and Infer Information? A Theoretical and Empirical Analysis in The Chameleon Game. [PDF]
Mustafa O. Karabag, **Jan Sobotka**, Ufuk Topcu.
Under review (2025).

[5] Enhancing Fractional Gradient Descent with Learned Optimizers. [PDF]
Jan Sobotka, Petr Šimánek, Pavel Kordík.
ArXiv preprint (2025).

[6] Investigation into the Training Dynamics of Learned Optimizers. [PDF]
Jan Sobotka, Petr Šimánek, Daniel Vašata.
*International Conference on Agents and Artificial Intelligence (**ICAART 2024**).*

[7] Investigation into the Training Dynamics of Learned Optimizers (Student Abstract). [PDF]
Jan Sobotka, Petr Šimánek.
*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 efficient estimation of biological system parameters [OpenBioML].

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].

Extracurricular Activities

Organizer of the Traion Community of Student Entrepreneurs June 2020 – Feb. 2021
- Organized offline meetings, educational seminars, and workshops for student entrepreneurs.

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 105), German (A2)