

# 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. Accepted  
**Jan Sobotka**, Luca Baroni, Ján Antolík.  
*Neural Information Processing Systems (NeurIPS 2025)*.
- [2] Weak-to-Strong Generalization under Distribution Shifts. Accepted  
Myeongho Jeon\*, **Jan Sobotka**\*, Suhwan Choi\*, Maria Brbic.  
*Neural Information Processing Systems (NeurIPS 2025)*.
- [3] Reverse-Engineering Memory in DreamerV3: From Sparse Representations to Functional Circuits. Accepted  
**Jan Sobotka**, Auke Ijspeert, Guillaume Bellegarda.  
*Neural Information Processing Systems (NeurIPS 2025, Spotlight at MechInterp 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.  
*Preprint (2025)*.
- [5] Enhancing Fractional Gradient Descent with Learned Optimizers. [PDF   
**Jan Sobotka**, Petr Šimánek, Pavel Kordík.  
*Preprint (2024)*.
- [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

- |  |                       |
|--|-----------------------|
| <b>Deep Reinforcement Learning for Optimal Experimental Design in Biology</b>  | Jan. 2023 – June 2023 |
| • Open research project focused on efficient estimation of biological system parameters [OpenBioML  ].    |                       |
| <b>Generative Models of Regulatory DNA Sequences Based on Diffusion Models</b>   | July 2022 – Dec. 2022 |
| • Open research project investigating the application of diffusion models to genomics data [OpenBioML  ]. |                       |

## EXTRACURRICULAR ACTIVITIES

- |   |                       |
|---|-----------------------|
| <b>Organizer of the Traion Community of Student Entrepreneurs</b>   | June 2020 – Feb. 2021 |
| • Organized offline meetings, educational seminars, and workshops for student entrepreneurs.              |                       |
| <b>Volunteer for an Entrepreneurship Education Program for Students</b>                                   | Dec. 2019 – Aug. 2020 |
| • Organized events and wrote a technology/entrepreneurship blog for the Soutěž and Podnikaj organization. |                       |
| <b>Pitcher at the Czech Republic National Baseball Team U-15</b>  | 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)