Marcin **Sendera**

PhD Candidate in Deep Learning

Kraków, Poland

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Professional Summary

Highly motivated PhD Candidate at Jagiellonian University with a primary research focus on probabilistic deep learning, generative models, reasoning, and AI safety. Collaborates with world-class researchers and possesses extensive international experience, including a productive internship at Mila with Prof. Yoshua Bengio focusing on diffusion models and Bayesian inference.
Proven track record of leading and contributing to high-impact research, resulting in multiple first-author publications at top-tier conferences such as NeurIPS and ICML. Principal Investigator on a Polish National Science Centre (NCN) grant.

Research Interests

Probabilistic & Bayesian Deep Learning, Generative Models, Density Estimation, Diffusion Models, Machine Unlearning, Meta-Learning, AI Safety, and Reasoning in AI.

Education

Jagiellonian University, Doctoral School of Exact and Natural Sciences
Kraków, Poland

Ph.D. in Computer Science — *Oct. 2019 - Present*

- Expected date of PhD defence (viva): end of 2025 or beginning of 2026.
- Thesis: *"Probabilistic deep learning: from efficient sampling to principled generation"*. Advisor: Prof. Jacek Tabor.
- GPA: 5.00/5.00
- Research focus on probabilistic approaches in deep learning, particularly density estimation, sampling from unnormalized distributions, generative models, and Bayesian inference. Concurrently developing methods in meta-learning and machine unlearning.

AGH University of Science and Technology
Kraków, Poland

M.Sc. in Computer Science — *Mar. 2017 - Apr. 2019*

- GPA: 4.46/5.00
- Thesis: *"Data adaptation in HANDY economy-ideology model"*. Advisor: Prof. Witold Dzwinel.

AGH University of Science and Technology
Kraków, Poland

B.Eng. in Computer Science — *Oct. 2013 - Feb. 2017*

- GPA: 4.28/5.00
- Thesis: *"Car Travel Assistant"*. Advisor: Dr. Eng. Łukasz Czekierda.

Research Experience

Mila – Québec Artificial Intelligence Institute, Université de Montréal
Montréal, Canada

Research Intern — *Oct. 2023 - Sep. 2024*

- Conducted research in the group of Prof. Yoshua Bengio, focusing on improving diffusion samplers, modeling Bayesian posteriors, and Safe AI.
- This collaboration has so far resulted in four papers accepted at top-tier conferences (ICML, NeurIPS), with a leading author role in two of them.
- The collaboration on ongoing projects related to probabilistic inference (*e.g.,* in AI for Science solutions) is still active.

Hutchison-MRC Research Centre, University of Cambridge
Cambridge, UK

Research Intern (Summer Studentship) — *Jul. 2018 - Sep. 2018*

- Worked in the group of Dr. Shamith Samarajiwa on deep learning methods for early cancer detection and multi-class classification from epigenetic (DNA methylation) data.
- Developed a method achieving 98.2% accuracy in multi-class classification between normal data and 13 different cancer types, leading to a journal publication (*i.e., "Early detection and diagnosis of cancer with interpretable machine learning to uncover cancer-specific DNA methylation patterns"*).

Industry Experience

UBS — *Kraków, Poland*

Machine Learning Engineer — *Jan. 2020 - Jul. 2021*

- Worked in an AI/ML R&D team to create an automated system for data extraction from various document formats (PDF, PNG, etc.) using state-of-the-art Large Language Models (LLMs).
- Developed an LLM-based solution to support decision-making processes for investments in financial instruments.

UBS — *Kraków, Poland*

Intern in AI/ML R&D team — *Aug. 2019 - Dec. 2019*

- Worked in an AI/ML R&D team as an intern, which led to change my position to the Machine Learning Engineer.
- Job was focused on using and evaluating the potential of Large Language Models (LLMs) to different asspects of UBS activity.

Grants & Awards

Awards

2025	**Witold Lipski Award for Young Computer Scientists**, Awarded for outstanding achievements in applied computer science	*Poland*
2023	**Best Paper Award Finalist at WACV 2023**, For ”HyperShot: Few-shot learning by kernel hypernetworks”, (*i.e.,* top 12 of 639 papers).	*Waikoloa, USA*

Grants

2024 – Present	**Team Member in CIFAR AI Catalyst Grant**, Team Member in the project: ”AI Mathematician” (PI: Dr. Nikolay Malkin, University of Edinburgh).	*Canada*
2022 – Present	**National Science Centre (NCN) PRELUDIUM 21 Grant**, Principal Investigator in the project: ”How to learn faster: towards better adaptation in Meta-Learning” (Funding: 139,471 PLN).	*Poland*
2021 – Present	**Scholarships in National Science Centre (NCN) Grants**, OPUS 25 (PI: Prof. Jacek Tabor), OPUS 22 & OPUS 19 (PI: Prof. Maciej Zięba).	*Poland*
2021 – 2022	**Mini-grant for Young Scientists, POB DigiWorld**, Principal Investigator in the project: ”Deep Gaussian Processes for motion tracking with the use of Normalizing Flows” (Funding: 20,000 PLN).	*Poland*

Invited Talks & Presentations

Posters presentations

Revisiting the Equivalence of Bayesian Neural Networks and Gaussian Processes: On the Importance of Learning Activations — *Rio de Janeiro, Brazil*

Conference on Uncertainty in Artificial Intelligence (UAI) — *Jul. 2025*

SEMU: Singular Value Decomposition for Efficient Machine Unlearning — *Vancouver, Canada*

International Conference on Machine Learning (ICML) — *Jul. 2025*

Outsourced diffusion sampling: Efficient posterior inference in latent spaces of generative models — *Vancouver, Canada*

International Conference on Machine Learning (ICML) — *Jul. 2025*

Improved off-policy training of diffusion samplers — *Vancouver, Canada*

Conference on Neural Information Processing Systems (NeurIPS) — *Dec. 2024*

Amortizing intractable inference in diffusion models for vision, language, and control — *Vancouver, Canada*

Conference on Neural Information Processing Systems (NeurIPS) — *Dec. 2024*

HyperShot: Few-Shot Learning by Kernel HyperNetworks *Waikoloa, USA*
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) *Jan. 2023*

Non-Gaussian Gaussian Processes for Few-Shot Regression *Virtual*
Conference on Neural Information Processing Systems (NeurIPS) *Dec. 2021*

Missing Glow Phenomenon: Learning Disentangled Representation of Missing Data *Virtual*
International Conference on Neural Information Processing (ICONIP) *Dec. 2021*

Academic Service

Conference Reviewer ICML (2022, 2024, 2025), NeurIPS (2023, 2025), ICLR (2024, 2025), WACV (2023), COLLAS (2023, 2024)

Summer School Organization
- Co-organizer for MLSS on Drug and Materials Discovery (2025).
- Volunteer for MLSS on Applications in Science (2023).
- Volunteer for MLSS on on Neuroscience (2022).

Academic Representation
- Council of the Faculty of Mathematics and Computer Science, Jagiellonian University (2022 – 2024).
- Council of the Institute of Computer Science, Jagiellonian University (2022 – 2025).

Memberships Member of the Machine Learning Research Group (GMUM) at Jagiellonian University (2019 – Present)

Publications

Conference Proceedings

SEMU: Singular Value Decomposition for Efficient Machine Unlearning
Marcin Sendera, Łukasz Struski, Kamil Książek, Kryspin Musiol, Jacek Tabor, Dawid Rymarczyk
International Conference on Machine Learning (ICML), 2025

Revisiting the Equivalence of Bayesian Neural Networks and Gaussian Processes: On the Importance of Learning Activations
Marcin Sendera*, Amin Sorkhei, Tomasz Kuśmierczyk*
Conference on Uncertainty in Artificial Intelligence (UAI), 2025

Outsourced diffusion sampling: Efficient posterior inference in latent spaces of generative models
Siddarth Venkatraman*, Mohsin Hasan*, Minsu Kim, Luca Scimeca, **Marcin Sendera**, Yoshua Bengio, Glen Berseth, Nikolay Malkin
International Conference on Machine Learning (ICML), 2025

Iterated Denoising Energy Matching for Sampling from Boltzmann Densities
Tara Akhound-Sadegh*, Jarrid Rector-Brooks*, Joey Bose*, Sarthak Mittal, Pablo Lemos, Cheng-Hao Liu, **Marcin Sendera**, Siamak Ravanbakhsh, Gauthier Gidel, Yoshua Bengio
International Conference on Machine Learning (ICML), 2024

Improved off-policy training of diffusion samplers
Marcin Sendera, Minsu Kim, Sarthak Mittal, Pablo Lemos, Luca Scimeca, Jarrid Rector-Brooks, Alexandre Adam, Yoshua Bengio, Nikolay Malkin
Conference on Neural Information Processing Systems (NeurIPS), 2024

Amortizing intractable inference in diffusion models for vision, language, and control
Siddarth Venkatraman*, Moksh Jain*, Luca Scimeca*, Minsu Kim*, **Marcin Sendera***, Mohsin Hasan, Luke Rowe, Sarthak Mittal, Pablo Lemos, Emmanuel Bengio
Conference on Neural Information Processing Systems (NeurIPS), 2024

Hypershot: Few-shot learning by kernel hypernetworks
Marcin Sendera*, Marcin Przewięźlikowski*, Konrad Karanowski, Maciej Zięba, Jacek Tabor, Przemysław Spurek
Proceedings of the IEEE/CVF winter conference on applications of computer vision (WACV), 2023

Missing Glow Phenomenon: Learning Disentangled Representation of Missing Data
Marcin Sendera, Łukasz Struski, Przemysław Spurek
International Conference on Neural Information Processing (ICONIP), 2021

Non-gaussian gaussian processes for few-shot regression
Marcin Sendera, Jacek Tabor, Aleksandra Nowak, Andrzej Bedychaj, Massimiliano Patacchiola, Tomasz Trzcinski, Przemysław Spurek, Maciej Zieba
Conference on Neural Information Processing Systems (NeurIPS), 2021

Supermodeling: the next level of abstraction in the use of data assimilation
Marcin Sendera, Gregory S Duane, Witold Dzwinel
International Conference on Computational Sciences (ICCS), 2020

Journal Articles

From discrete-time policies to continuous-time diffusion samplers: Asymptotic equivalences and faster training
Julius Berner*, Lorenz Richter*, **Marcin Sendera***, Jarrid Rector-Brooks, Nikolay Malkin
arXiv preprint arXiv:2501.06148 (2025). 2025

AutoLoRA: AutoGuidance Meets Low-Rank Adaptation for Diffusion Models
Artur Kasymov, **Marcin Sendera**, Michał Stypułkowski, Maciej Zięba, Przemysław Spurek
arXiv preprint arXiv:2410.03941 (2024). 2024

Early detection and diagnosis of cancer with interpretable machine learning to uncover cancer-specific DNA methylation patterns
Izzy Newsham, **Marcin Sendera**, Sri Ganesh Jammula, Shamith A Samarajiwa
Biology Methods and Protocols 9.1 (2024) bpae028. Oxford University Press, 2024

The general framework for few-shot learning by kernel HyperNetworks
Marcin Sendera*, Marcin Przewięźlikowski*, Jan Miksa, Mateusz Rajski, Konrad Karanowski, Maciej Zięba, Jacek Tabor, Przemysław Spurek
Machine Vision and Applications 34.4 (2023) p. 53. Springer, 2023

OneFlow: One-class flow for anomaly detection based on a minimal volume region
Łukasz Maziarka, Marek Śmieja, **Marcin Sendera**, Łukasz Struski, Jacek Tabor, Przemysław Spurek
IEEE Transactions on Pattern Analysis and Machine Intelligence 44.11 (2021) pp. 8508–8519. IEEE, 2021

Workshop papers

Solving Bayesian inverse problems with diffusion priors and off-policy RL
Luca Scimeca*, Siddarth Venkatraman*, Moksh Jain*, Minsu Kim*, **Marcin Sendera***, Mohsin Hasan, Alexandre Adam, Yashar Hezaveh, Laurence Perreault-Levasseur, Yoshua Bengio
ICLR 2025 Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy, * equal contribution, 2025

Hi-fi functional priors by learning activations
Marcin Sendera*, Amin Sorkhei, Tomasz Kuśmierczyk*
NeurIPS 2024 Workshop on Bayesian Decision-making and Uncertainty, * equal contribution, 2024

Amortizing intractable inference in diffusion models for Bayesian inverse problems
Siddarth Venkatraman*, Moksh Jain*, Luca Scimeca*, Minsu Kim*, **Marcin Sendera***, Mohsin Hasan, Luke Rowe, Sarthak Mittal, Pablo Lemos, Emmanuel Bengio
Proc. Workshop on Machine Learning and the Physical Sciences. Accessed, * equal contribution, 2024

Flow-based SVDD for anomaly detection
Marcin Sendera, Marek Śmieja, Łukasz Maziarka, Łukasz Struski, Przemysław Spurek, Jacek Tabor
ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models, 2021

Preprints

From discrete-time policies to continuous-time diffusion samplers: Asymptotic equivalences and faster training
Julius Berner*, Lorenz Richter*, **Marcin Sendera***, Jarrid Rector-Brooks, Nikolay Malkin
arXiv preprint arXiv:2501.06148 (2025). 2025

AutoLoRA: AutoGuidance Meets Low-Rank Adaptation for Diffusion Models
Artur Kasymov, **Marcin Sendera**, Michał Stypułkowski, Maciej Zięba, Przemysław Spurek
arXiv preprint arXiv:2410.03941 (2024). 2024

References

Available upon request.

A letter of recommendation from Prof. Yoshua Bengio is available upon request.