

Petra Poklukar

◇ Körsbärsvägen 9, 11423 Stockholm, Sweden ◇ Born 16 February 1993, Slovenia
◇ [petra.poklukar\[at\]gmail.com](mailto:petra.poklukar[at]gmail.com) ◇ <https://people.kth.se/~poklukar/> ◇ <https://github.com/petrapoklukar>

Education

12.2018 - 06.2022	PhD in Machine Learning ◇ KTH Royal Institute of Technology, Sweden. Research area Representation Learning, Generative Models, Geometric Deep Learning Doctoral thesis Learning and Evaluating the Geometric Structure of Representation Spaces.
11.2014 - 09.2016	Master of Mathematics ◇ ETH Zürich, Switzerland ◇ Faculty of Mathematics and Physics, University of Ljubljana, Slovenia. Average grade 9,27 (highest 10). Major Algebraic Topology Master thesis On the Real Spectrum Compactification of Teichmüller space (in English) - Awarded with dr. France Prešern Award; achieved grade 10 (highest 10).
10.2011 - 09.2014	Bachelor of Mathematics ◇ Faculty of Mathematics and Physics, University of Ljubljana, Slovenia. Average grade 9,06 (highest 10). Bachelor thesis Operations on Smooth Manifolds (in Slovenian); achieved grade 10/9 (highest 10/10).

Work Experience

04.2022 - 07.2022	Research Intern ◇ Google Brain, Zürich, Switzerland. Investigated hyperbolic Variational Autoencoders for efficient reconstruction of phylogenetic trees for protein sequences.
09.2018 - 12.2018	Data Scientist ◇ King Midasplayer AB, Stockholm, Sweden. Designed A/B tests and provided data-driven playtesting insights for the game team in order to improve monetization; participated in database design and in data migration from Apache Hive to BigQuery.
02.2018 - 09.2018	Data Science Intern , ◇ King Midasplayer AB, Stockholm, Sweden. Provided data-driven analyses for improving game monetization and retention using Pandas, NumPy, SciPy, Plotly and Apache Hive; designed tracking requirements and data storage for new game features.
10.2016 - 02.2018	PhD student in Theoretical Mathematics ◇ Stockholm University, Sweden. Spent a year researching about algebraic topology from category theory perspective; completed several doctoral level courses related to the research topic.
02.2015 - 09.2015	Software Developer Intern ◇ Jožef Stefan Institute, Computer Systems Department, Jamova 39, 1000 Ljubljana, Slovenia. Project Developed a C# console application for tracking user's gaze on a website using a Tobii EyeX eye tracking device and Selenium WebDriver.

Skills

Software	
Skilled	Python [Pytorch, NumPy, SciPy, SciKit-Learn, Jax, Flax], Git, bash
Used	Tensorflow, SQL, C#, Wolfram Mathematica, R, Haskell, SML, Racket, PHP
Selected projects	Delaunay Component Analysis for Evaluation of Data Representations [code]

Free-time courses	<p>GeomCA: Geometric Evaluation of Data Representations [code]</p> <p>Experimental implementation of a contrastive GAN using Pytorch Lightning [ongoing - code]</p> <p>InfoGAN implementation for generating robot trajectories [code]</p> <p>Latent Space Roadmap for Visual Action Planning [code]</p> <p>Searching an infinite set in a finite time in Haskell [code]</p>
Free-time courses	<p>Programming with C# (completed, edX)</p> <p>Introduction to Java programming (completed, edX)</p> <p>Machine Learning (completed, Coursera)</p>
Communication	
Selected Talks	<p>Learning and Evaluating the Geometric Structure of Representation Spaces, PhD Defence presentation ◊ June 2022 [Slides]</p> <p>Learning and Evaluating Data Representations, Women in Data Science Ljubljana ◊ June 2021 [Slides]</p> <p>Variational autoencoders: from theory to implementation, Kidbrooke Advisory ◊ November 2019 [Slides]</p> <p>Real-Time Visual WikiHow for Recycling, STHLM TECH Hackathon winning pitch for StoraEnso ◊ September 2019 [Slides]</p>
Organization	<p>Geometry and Machine Learning Reading Group ◊ Ongoing since Spring 2020</p> <p>Machine Learning Reading Group ◊ Ongoing since Fall 2019</p> <p>One of the organizers of the conference Young Topologists Meeting 2017</p>
Language skills	Slovenian (native), English (fluent), Swedish (fluent)

Publications

- ◊ [P. Poklukar*](#), M. Vasco*, H. Yin, F. S. Melo, A. Paiva, D. Kragic, [Geometric Multimodal Contrastive Representation Learning](#), International Conference on Machine Learning (ICML). PMLR, 2022
- ◊ A. Ghadirzadeh*, [P. Poklukar*](#), V. Kyrki, D. Kragic, M. Björkman, [Training and Evaluation of Deep Policies using Reinforcement Learning and Generative Models](#) arXiv preprint arXiv:2204.08573 (2022), accepted to Journal of Machine Learning Research (JMLR).
- ◊ C. Ceylan*, [P. Poklukar*](#), H. Hultin, A. Kravchenko, A. Varava, D. Kragic, [GraphDCA - a Framework for Node Distribution Comparison in Real and Synthetic Graphs](#), arXiv preprint arXiv:2202.03884 (2022), under review.
- ◊ [P. Poklukar](#), V. Polianskii, A. Varava, F. Pokorný, D. Kragic, [Delaunay Component Analysis for Evaluation of Data Representations](#), International Conference on Learning Representations (ICLR) 2022.
- ◊ [P. Poklukar](#), A. Varava, D. Kragic, [GeomCA: Geometric Evaluation of Data Representations](#), International Conference on Machine Learning (ICML). PMLR, 2021.
- ◊ M. Lippi*, [P. Poklukar*](#), M. C. Welle*, A. Varava, H. Yin, A. Marino, D. Kragic, [Enabling Visual Action Planning for Object Manipulation through Latent Space Roadmap](#), arXiv preprint arXiv:2103.02554 (2021), accepted to IEEE Transactions on Robotics (T-RO).
- ◊ M. Lippi*, [P. Poklukar*](#), M. C. Welle*, A. Varava, H. Yin, A. Marino, D. Kragic, [Latent Space Roadmap for Visual Action Planning of Deformable and Rigid Object Manipulation](#), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).
- ◊ [P. Poklukar](#), J. Butepage, D. Kragic, [Seeing the whole picture instead of a single point: Self-supervised likelihood learning for deep generative models](#), 2nd Symposium on AABI 2019
- ◊ J. Butepage, [P. Poklukar](#), D. Kragic, [Modeling assumptions and evaluation schemes: On the assessment of deep latent variable models](#), CVPR Workshop on Uncertainty and Robustness in Deep Learning 2019

Teaching and Supervision

Teaching	Machine Learning Msc [Teaching Assistant] ◊ Fall 2019, Fall 2020, Fall 2021 Data Science Project Course Msc [Teaching Assistant] ◊ Fall 2020
Supervision	
Spring 2022	Tommy Wallin, <i>Structural comparison of data representations obtained from generative and supervised models</i> [Master thesis]
Autumn 2022	Samuel Norling, <i>Efficient conditioned Masked Autoregressive Flow</i> [Master thesis]
Spring 2021	David Norrman, <i>Semantic segmentation for improving OOD detection using VAEs and normalizing flow models</i> [Master thesis]
Spring 2021	Simon Westberg, <i>Investigating learning behaviour of GANs</i> [Master thesis]
Fall 2020	Joakim Dahl, <i>Analyzing disentanglement in VAEs latent spaces</i> [Master thesis]

Awards and Scholarships

November 2016	dr. France Prešeren Award for the best master thesis.
07.2014 - 09.2016	Jožef Stefan Institute internship scholarship.

Extracurricular Activities and Interests

Dancing instructor	International experience of teaching Lindy Hop and Authentic Jazz dance for various dancing schools in Slovenia and Switzerland.
Hobbies	Squash! When I don't play squash, I also do interval running, swimming, hiking, strength training and all kinds of swing dancing - lindy hop, charleston and authentic jazz, tap dancing. I am always up for new challenges :)