

Rati DEVIDZE

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OBJECTIVE: I am a reinforcement learning Researcher with more than 7 years of work experience in academia and industry

EDUCATION

PRESENT NOV 2018	Ph.D. - Computer Science - Saarland University (UdS) – Germany <ul style="list-style-type: none">• Focus: Reward design for reinforcement learning agents.
AUG 2018 SEP 2016	Graduate School of Computer Science - Saarland University (UdS) – Germany <ul style="list-style-type: none">• Completed Courses: <i>The Elements of Statistical Learning, Deep Learning, Information Retrieval and Data Mining.</i>
JULY 2016 SEP 2012	B.Sc. - Computer Science - Tbilisi State University (TSU) – Georgia <ul style="list-style-type: none">• GPA: 4/4 (Excellent)• Selected courses: <i>Algorithms and Data Structures, Statistics, Discrete Mathematics, Operation Research, Multivariable Calculus, Linear Algebra.</i>• Honors: President's Scholarship holder.

SKILLS

- **Reinforcement Learning:** Reward design; meta-reinforcement learning, inverse reinforcement learning.
- **Machine Learning:** Deep learning; inferential statistics; applied, algorithmic, and theoretical machine learning; optimization; statistics; data science.
- **Soft Skills:** Scientific and non-scientific presentations, ownership, teaching, leadership, and self-management.
- **Languages:** Georgian (native), English (professional), German (C1), Russian (A2).

WORK EXPERIENCE

PRESENT NOV 2018	Ph.D. Research Assistant - Max Planck Institute (MPI-SWS) – Germany <ul style="list-style-type: none">• I started a Reinforcement Learning research at the MPI-SWS. I conduct research focused on reward design in reinforcement learning [2, 1].• (Inverse-)Reinforcement learning, scientific publications, papers writing, leading research, built systems to gather, process, and analyze different reinforcement learning algorithms and data.
MAY 2018 FEB 2018	Research Immersion Lab - Max Planck Institute (MPI-SWS) – Germany <ul style="list-style-type: none">• I worked in Machine Teaching Group of Dr. Adish Singla. I contributed to our project with Dr. Parameswaran Kamalaruban where we worked on the iterative machine teaching problem in the context of the Markov Decision Process [3].• I implemented a Markov Decision Process solver and performed experiments to evaluate theoretical results.
SEP 2017 JULY 2017	Research Immersion Lab - Helmholtz Center for Information Security (CISPA) – Germany <ul style="list-style-type: none">• Worked on accountability of security protocols. Analyzed the security of these protocols using theorem prover Tamarin.
MAY 2016 MAR 2014	Engineer Programmer - Akhali Kselebi Ltd – Georgia <ul style="list-style-type: none">• Implemented desktop applications for the station operators.• Analysed international call statistic using ASP.NET charts• Implemented Windows and Web-services of billing system for telecommunications
AUG 2016 MAY 2016	.Net Software Developer - Prodware Group – Georgia <ul style="list-style-type: none">• Implemented new software products for business ideas.• Added new features to existing software.

PROJECTS

- **Explicable Reward Design for Reinforcement Learning Agents:** Scientific work where we seek to capture two properties of reward functions: (a) informativeness so that the rewards speed up the agent's convergence, and (b) sparseness so that the rewards are easy to interpret and debug [2].
- **Exploration-Guided Reward Shaping for Reinforcement Learning under Sparse Rewards:** Scientific work where we used meta-gradient reinforcement learning methods to derive a framework that operates in a fully self-supervised manner and can accelerate an agent's learning even in sparse-reward environments [1].
- **Curriculum Design for Teaching via Demonstrations:** Scientific work where we studied teaching via demonstrations in sequential decision making settings. In particular, how to design a personalized curriculum over demonstrations to speed up the learner's convergence [3, 4].

TEACHING

- **2021:** Teaching Assistant for Reinforcement Learning course at MPI-SWS and Saarland University.
- **2020:** Teaching Assistant for seminar course Multi-agent Reinforcement Learning at MPI-SWS and Saarland University.
- **2019:** Teaching Assistant for seminar course Machine Teaching at MPI-SWS and Saarland University.

SELECTED PUBLICATIONS

My work has been published at top venues in machine learning, including ICML, NeurIPS, IJCAI, and more.
For a complete list of publications, kindly check my Google Scholar or DBLP profile.

- [1] Rati Devidze, Parameswaran Kamalaruban, and Adish Singla. Exploration-guided reward shaping for reinforcement learning under sparse rewards. In *Advances in Neural Information Processing Systems 36th Annual Conference on Neural Information Processing Systems 2022, NeurIPS 2022*.
- [2] Rati Devidze, Goran Radanovic, Parameswaran Kamalaruban, and Adish Singla. Explicable reward design for reinforcement learning agents. In *Advances in Neural Information Processing Systems 35th Annual Conference on Neural Information Processing Systems 2021, NeurIPS 2021*.
- [3] Parameswaran Kamalaruban, Rati Devidze, Volkan Cevher, and Adish Singla. Interactive teaching algorithms for inverse reinforcement learning. In *Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China, August 10-16, 2019*, pages 2692–2700, 2019.
- [4] Gaurav Yengera, Rati Devidze, Parameswaran Kamalaruban, and Adish Singla. Curriculum design for teaching via demonstrations: Theory and applications. In *Advances in Neural Information Processing Systems 35th Annual Conference on Neural Information Processing Systems 2021, NeurIPS 2021*.

HONORS AND AWARDS

- Scholarship at Graduate School of Computer Science at Saarland University (3% of the applicants are selected).
- Granted a German Academic Exchange Service (DAAD) scholarship in 2014 for German language training at RWTH Aachen University.
- President’s Scholarship holder at Tbilisi State University