Rati DEVIDZE

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OBJECTIVE: I am a reinforcement learning researcher (all but dissertation PhD student) with more than 7 years of work experience in academia and industry, now seeking full-time job opportunities in the field of Reinforcement Learning, Machine Learning, AI, and Robotics.

EDUCATION

PRESENT Nov 2018	 Ph.D Computer Science - Saarland University (UdS) – Germany Focus: Reward design for reinforcement learning agents.
Aug 2018 Sep 2016	 Graduate School of Computer Science - Saarland University (UdS) – Germany Completed Courses: The Elements of Statistical Learning, Deep Learning, Information Retrieval and Data Mining.
July 2016 Sep 2012	 B.Sc Computer Science - Tbilisi State University (TSU) - Georgia GPA: 4/4 (Excellent) Selected courses: Algorithms and Data Structures, Statistics, Discrete Mathematics, Operation Research, Multivariable Calculus, Linear Algebra. Honory: Descident's Schelarship helder.

• Honors: President's Scholarship holder.

Skills

- Reinforcement Learning: Reward design; Meta Reinforcement Learning; Inverse Reinforcement Learning; Large Language Models.
- Machine Learning: Deep Learning; Inferential Statistics; Applied, Algorithmic, and Theoretical Machine Learning; Optimization; Statistics; Data Science.
- Soft Skills: Scientific and Non-scientific Presentations; Teaching; Leadership; 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 I started a Reinforcement Learning research at the MPI-SWS. I conduct research focused on reward design in reinforcement learning [3, 1, 2]. (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 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 [4]. 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 Worked on accountability of security protocols. Analyzed the security of these protocols using theorem prover Tamarin.
Aug 2016 May 2016	 .Net Software Developer - Prodware Group – Georgia Implemented new software products for business ideas. Added new features to existing software.
May 2016 Mar 2014	 Engineer Programmer - Akhali Kselebi Ltd – Georgia 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

Projects

- Explicaple 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 [3, 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 [4, 5].

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, Parameswaran Kamalaruban, and Adish Singla. Informativeness of reward functions in reinforcement learning. In Proceedings of the 2024 International Conference on Autonomous Agents and Multiagent Systems, AAMAS 2024.
- [3] 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.
- [4] 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.
- [5] 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