

# Ruben Glatt

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Postdoctoral Researcher Reinforcement Learning at Lawrence Livermore National Laboratory

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## Summary

With a background in Mechatronics and Mechanical Engineering, Ruben has turned to Artificial Intelligence where his main interest lies in Machine Learning (ML) research with a focus on Reinforcement Learning (RL), autonomous systems, and applications in energy efficiency.

He received his Ph.D. in Computer Engineering in the area of ML at the [University of São Paulo \(USP\)](#), Brazil, holds a master degree in Mechanical Engineering in the area of controlling mechanical systems from the [Universidade Estadual Paulista Júlio de Mesquita Filho \(UNESP\)](#), Brazil, and a Diplom-Ingenieur degree in Mechatronics in the area of sensors and robotics from the [Karlsruhe Institute of Technology \(KIT\)](#), Germany. Ruben has acquired years of professional experiences before and during his studies while working in the tech-

nology and energy sector, as well as in the organization of international ML conferences. After converting from a postdoctoral position at the [Lawrence Livermore National Laboratory](#), USA, he is now working as a Machine Learning Researcher on a variety of RL projects to develop methods for collaborative autonomy in multi-agent systems, interpretable RL, and real-world applications. Ruben also acts as the chair of the [Lawrence Livermore Postdoc Association](#) and represents the Lab's postdocs in the [Institutional Postdoc Program Board](#). Ruben's long term research interest lies in successfully applying RL techniques to real-world challenges to accelerate and improve decision-making, autonomously or as a support tool for humans, preferably for applications in energy and smart mobility systems.

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## Professional Experience

Machine Learning Researcher

LIVERMORE (CA, USA)

[Lawrence Livermore National Laboratory](#)

07/2019 – present

*Collaborative Autonomy:* RL in multi-agent systems to autonomously learn in collaborative and competitive settings. *Electro-mobility:* Principal Investigator on improving driving and charging behavior for electric vehicles in on-demand transportation services. *Symbolic Optimization:* Developing new methods for regression and control problems combining RL and SO. *Power electronics:* Autonomous generation of power converter topologies.

Research Intern

REDMOND (WA, USA)

[Microsoft Research](#)

06/2018 – 10/2018

*Automating software testing:* Worked at the intersection of Software Engineering and Machine Learning to apply Reinforcement Learning techniques to facilitate software testing.

Lead Organizer

Various locations

[PAPIs.io](#)

02/2017 – 07/2019

*Project management:* Planned and organized international Machine Learning conferences in London, Boston, & São Paulo. *Business Development:* Expanded conferences to LATAM and increased frequency of conferences. *Partner management:* Initiated and negotiated new partnerships with sponsor and community groups. *People management:* Selected and coordinated team members.

Research Assistant (Bolsista FUNDUNESP)

GUARATINGUETÁ (BRAZIL)

[Universidade Estadual Paulista Júlio de Mesquita Filho, UNESP](#)

03/2012 – 03/2013

*Project management:* Planned and projected a condition based maintenance system in hydroelectric power plants using thermal imaging. *Hard- & Software Development:* Realized a low-cost surveillance system based on open source micro-controller technology for automatic unsupervised monitoring. *Mechanical Design:* Designed support structures for static and dynamic camera systems.

Datacenter Engineer

KARLSRUHE (GERMANY)

[United Internet AG](#)

09/2001 – 12/2011

*Datacenter monitoring:* Developed and administered control & monitoring systems for sensor networks. *Datacenter optimization:* Supported infrastructure optimization based on statistical analysis of sensor data and evaluation of new technologies. *Server relocations:* Planned and organized server relocations in and between Germany and the US. *Server Homing:* Technical responsible for server homing customers. *Technical support:* Handled all datacenter related issues in a small team.

Energy Engineer

KARLSRUHE (GERMANY)

[SanioSolar](#)

07/2011 – 12/2011

*Energy consulting:* Projected, installed, and monitored small photovoltaic plants and provided engineering services around energy-efficiency for SMBs and private households.

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## Education

<b>Escola Politécnica da Universidade de São Paulo, USP</b>	SÃO PAULO, BRAZIL
<b>Ph.D. in Computer Engineering, completed (CAPES scholar 03/2015-09/2018)</b>	03/2015 – 06/2019
<i>Improving DRL through knowledge transfer: Extended DRL algorithms with Transfer Learning capabilities to improve the generalization of knowledge to speed up and improve learning for sequential tasks.</i>	
<i>Advisor: Prof. Dra. Anna Helena Reali Costa</i>	
<b>Universidade Estadual Paulista Júlio de Mesquita Filho, UNESP</b>	GUARATINGUETÁ, BRAZIL
<b>M.Eng. in Mechanical Engineering, completed (CAPES scholar 04/2013-07/2014)</b>	08/2012 – 07/2014
<i>Deep Learning Architecture for Gesture Recognition: Multiple instance, user independent recognition of Italian sign gestures from multi-modal data using a Deep Belief Net.</i>	
<i>Advisor: Prof. Dr. José Celso Freire Junior, Co-Advisor: Dr. Daniel Julien Barros da Silva Sampaio</i>	
<b>Karlsruhe Institute of Technology, KIT</b>	KARLSRUHE, GERMANY
<b>Diplom-Ingenieur in Mechatronics, completed</b>	10/2004 – 09/2011
<i>Autonomous robotics platform: Developed micro-controller board for motor control and sensor integration.</i>	
<i>Solar system evaluation: Processed and analyzed historical solar data. Business and maturity models: Evaluated CMMI and SPICE integration for business models for technical service providers.</i>	
<i>Advisor: Prof. Dr.-Ing. Michael Braun</i>	

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## Awards & Honors

<b>Heidelberg Laureate Forum (HLF)</b>	2020 + 2017
<b>Outstanding Young Researcher</b>	
<b>Upsilon Pi Epsilon Honor Society Award (IEEE Computer Society)</b>	2019
<b>Winner (awarded for academic achievements and extracurricular activities)</b>	
<b>31st AAAI Conference on Artificial Intelligence (AAAI)</b>	2017
<b>Doctoral Consortium travel grant (<i>Improving DRL through knowledge transfer</i>)</b>	
<b>Best Student Poster (<i>An Advising Framework for Multiagent Reinforcement Learning Systems</i>)</b>	
<b>Google Research Award Latin-America</b>	2015 + 2016
<b>Winner (<i>Improving DRL through knowledge transfer</i>)</b>	
<b>5th Postgraduate Workshop in Computer Engineering</b>	2016
<b>Distinguished Work Award (<i>Improving DRL through knowledge transfer</i>)</b>	
<b>5th Brazilian Conference on Intelligent Systems (BRACIS)</b>	2016
<b>Best Paper 1st Place (<i>Object-Oriented Reinforcement Learning in Cooperative Multiagent Domains</i>)</b>	
<b>Nvidia GPU Grant</b>	2016
<b>GPU Donation for Ph.D. Project</b>	
<b>Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)</b>	03/2015 – 09/2018
<b>Ph.D. Research Scholarship</b>	
<b>Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)</b>	04/2013 – 07/2014
<b>M.Sc. Research Scholarship</b>	
<b>Fundação para o Desenvolvimento da UNESP (FUNDUNESP)</b>	03/2012 – 03/2013
<b>Project Research Scholarship</b>	

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## Other Relevant Activities

<b>Lawrence Livermore Postdoc Association</b>	03/2020 – present
<b>Chair ( and Postdoc Representative on the Institutional Postdoc Program Board)</b>	
<b>LLESA Networking groups - Robotics and Automation</b>	05/2021 – present
<b>Treasurer</b>	
<b>IEEE - Artificial Intelligence Standards Committee (AI/SC)</b>	06/2021 – present
<b>Member</b>	
<b>Academic Workshop Organization</b>	2017 – present
<b>LLNL Center for Advanced Signal and Image Sciences (CASIS) Workshop 2021. Workshop on Scaling up Reinforcement Learning (SURL), @ ECML 2017 &amp; IJCAI 2019. Workshop on Transfer in Reinforcement Learning (TiRL), @ AAMAS 2017.</b>	
<b>Publication reviewer</b>	2015 – present
<b>Multiple top tier journals, conferences , and workshops</b>	

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## Speaker Engagements

Adaptive and Learning Agents (ALA) Workshop 05/2021  
Invited Panelist - Links between Industry, Academia and Governments in AI development

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## Program Committee Appointments

Conference on Artificial Intelligence (AAAI) 2021  
IEEE International Intelligent Transportation Systems Conference (ITSC) 2021  
Conference on Artificial Intelligence (AAAI) Doctoral Consortium 2021  
Tackling Climate Change with Machine Learning Workshop 2020, 2020, 2021  
Adaptive and Learning Agents (ALA) Workshop 2020, 2021  
Lifelong ML Workshop 2020  
LatinX in AI Workshop 2020  
Brazilian Conference on Intelligent System (BRACIS) 2018

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## Selected Publications (more and most recent on [Google Scholar profile](#))

- M. Landajuela, B. K. Petersen, S. K. Kim, C. P. Santiago, R. Glatt, et. al.** *Discovering symbolic policies with deep reinforcement learning*. In 38th International Conference on Machine Learning (ICML), 2021.
- M. Landajuela, B. K. Petersen, S. K. Kim, C. P. Santiago, R. Glatt, et. al.** *Improving Exploration in Policy Gradient Search: Application to Symbolic Optimization*. In 1st Mathematical Reasoning in General Artificial Intelligence Workshop at International Conference on Learning Representations (ICLR), 2021.
- W. A. Dawson, R. Glatt, E. Rusu, B. C. Soper, R. A. Goldhahn** *Hybrid information-driven multi-agent reinforcement learning*. In Challenges and Opportunities for Multi-Agent Reinforcement Learning (COMARL), 2021.
- R. Glatt, F. L. d. Silva, R. A. C. Bianchi & A. H. R. Costa** *DECAF: Deep case-based policy inference for knowledge transfer in reinforcement learning*. In Expert Systems With Applications, 2020.
- R. Glatt** *Knowledge reuse for deep reinforcement learning*. PhD thesis, 2019.
- J. Pettit, R. Glatt, J. R. Donadee & B. K. Petersen** *Increasing performance of electric vehicles in ride-hailing services using deep reinforcement learning*. In NeurIPS 2019 Workshop on Tackling Climate Change with Machine Learning, 2019.
- R. Glatt** *Enabling optimized charging of electric vehicles in mobility services*. Technical report, LLNL, 2019.
- F. L. d. Silva, R. Glatt, & A. H. R. Costa** *MOO-MDP: An object-oriented representation for cooperative multiagent reinforcement learning*. In IEEE Transactions on Cybernetics, 2019.
- R. Glatt, & A. H. R. Costa** *Policy reuse in deep reinforcement learning*. In 31st AAAI Conference on Artificial Intelligence (AAAI-17), 2017.
- R. Glatt, & A. H. R. Costa** *Improving Deep Reinforcement Learning with Knowledge Transfer*. In 31st AAAI Conference on Artificial Intelligence (AAAI-17), 2017.
- F. L. d. Silva, R. Glatt, & A. H. R. Costa** *An Advising Framework for Multiagent Reinforcement Learning Systems*. In 31st AAAI Conference on Artificial Intelligence (AAAI-17), 2017.
- R. Glatt, F. L. d. Silva & A. H. R. Costa** *Case-based Policy Inference for Transfer in Reinforcement Learning*. In 1st Workshop on Scaling-Up Reinforcement Learning at the 28th European Conference on Machine Learning (ECML), 2017.
- F. L. d. Silva, R. Glatt, & A. H. R. Costa** *Simultaneously Learning and Advising in Multiagent Reinforcement Learning*. In 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2017.
- R. C. Bonini, F. L. d. Silva, R. Glatt & A. H. R. Costa** *Transferring Probabilistic Options in Reinforcement Learning*. In 1st Workshop on Transfer in Reinforcement Learning (TiRL) at the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2017.
- R. Glatt, F. L. d. Silva, & A. H. R. Costa** *Towards knowledge transfer in deep reinforcement learning*. In 2016 Brazilian Conference on Intelligent Systems (BRACIS), 2016.
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