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Mikayel Samvelyan

Curriculum Vitae

Education

2020 – 2024 **University College London**, *United Kingdom*.
PhD in Computer Science
- Advised by Tim Rocktäschel and John Shawe-Taylor
- In partnership with Meta AI (FAIR)
- ELLIS PhD & PostDoc Program

2016 – 2017 **University of Oxford**, *United Kingdom*.
MSc in Computer Science
- Thesis: Factored Value Functions for Deep Multi-Agent Reinforcement Learning
- Advised by Shimon Whiteson

2014 – 2016 **Yerevan State University**, *Armenia*.
MSc in Informatics and Applied Mathematics

Fall 2013 **Delta State University**, *United States*.
Undergraduate Exchange in Computer Science

2010 – 2014 **Yerevan State University**, *Armenia*.
BSc in Informatics and Applied Mathematics

Research and Development Experience

09/20 – present **Meta AI (previously Facebook AI Research),** Research Assistant.

02/20 – 07/20 **USC Information Sciences Institute (via Toptal),** Research Engineer.

03/19 – 10/19 **Reddit (via Toptal),** Machine Learning Engineer.

10/17 – 08/20 **Toptal,** Machine Learning Engineer.

10/14 – 09/16 **Mentor Graphics (now Siemens)**, Research and Development Engineer.

10/12 – 07/13 **Exergy,** Software Engineer.

05/12 – 09/12 **Instigate Design,** Software Engineering Intern.

Awards and Distinctions

2022 – 2024 ELLIS PhD and PostDoc Program, European Laboratory for Learning and Intelligent Systems

2016 – 2017 Chevening Scholarship, Foreign Office, HM Government, UK

2016 – 2017 Luys Scholarship, Luys Foundation, Armenia

2016 – 2017 AGBU International Scholarship, USA

2014 – 2016 State Excellence Scholarship for Graduate Studies, Armenia (full scholarship)

2013 Global UGRAD Exchange Scholarship, US Department of State (full scholarship)

2013 3rd place in 1st Annual Robotics Competition AITP/DSU, USA

2012 Student of the Year Award, Department of Informatics and Applied Mathematics, YSU

2010 – 2014 State Excellence Scholarship for Undergraduate Studies, Armenia (full scholarship)

Teaching Experience

University College London, *Department of Computer Science*.
- Spring 2023: Statistical Natural Language Processing (COMP0087) (TA)
- Spring 2022: Reinforcement Learning (COMP0089) (TA)
- Spring 2022: Statistical Natural Language Processing (COMP0087) (TA)
- Spring 2021: Reinforcement Learning (COMP0089) (TA)
- Spring 2021: Statistical Natural Language Processing (COMP0087) (TA)

Russian-Armenian University, *Institute of Mathematics and Informatics*.
- Spring 2020: Data Structures (TA)
- Fall 2019: Machine Learning (Lecturer)
- Fall 2018: Machine Learning (Lecturer)
- Fall 2018: Operating Systems (TA)

American University of Armenia, *College of Science and Engineering*.
- Fall 2018: Artificial Intelligence (Guest Lecturer and TA)

SmartGateML: Yerevan Machine Learning Excellence Center.
- Spring 2018: Introduction to Machine Learning (Lecturer)
- Summer 2018: Applied Machine Learning (Lecturer)

Professional Service

Workshop Organization

2021 **Co-organizer**, *Workshop on Agent Learning in Open-Endedness (ALOE)*, ICLR 2022.

Competitions

2021 **Co-organizer**, *The NetHack Challenge*, NeurIPS 2021 Competition.

Reviewing

2021 – 2023 **ICLR**, International Conference on Learning Representations

2021 – 2022 **NeurIPS**, Neural Information Processing Systems

2021 **ICML**, International Conference on Machine Learning

2021 **NeurIPS: Datasets and Benchmarks Track**, Neural Information Processing Systems

2022 **TMLR**, Transactions of Machine Learning Research

Application Evaluations

2021 - 2022 **ELLIS PhD Program**, *European Lab for Learning and Intelligent Systems*, Evaluator.

Open-Source Repositories

2021 **MiniHack**, `github.com/facebookresearch/minihack`.
A sandbox framework for open-ended reinforcement learning research.

2019 **SMAC**, *StarCraft Multi-Agent Challenge*, `github.com/oxwhirl/smac`.
A benchmark for cooperative multi-agent reinforcement learning research based on StarCraft II.

2019 **PyMARL**, `github.com/oxwhirl/pymarl`.
A framework for deep multi-agent reinforcement learning research with implementations of several state-of-the-art algorithms, such as QMIX and COMA.

2020 **ADAM Visual Perception**, `github.com/isi-vista/adam-visual-perception`.
This project explores how two aspects of visual perception which are vital for early language learning can be captured by algorithms..

Supervision

2022 **Co-Supervisor**, *University College London, UK*.
Jonathan Cook, MSc in Computational Statistics and Machine Learning

2021 **Co-Supervisor**, *University College London, UK*.
Michael Matthews, MSc in Machine Learning

2021 **Co-Supervisor**, *University College London, UK*.
Hannah Teufel, MSc in Machine Learning

2021 **Co-Supervisor**, *University College London, UK*.
Robert McHardy, MSc in Machine Learning

Publications

Journal Publications

2020 T. Rashid*, **M. Samvelyan***, C. Schroeder de Witt, G. Farquhar, J. Foerster, S. Whiteson, "Monotonic Value Function Factorisation for Deep Multi-Agent Reinforcement Learning", *Journal of Machine Learning Research 21(178):1-51*, [paper].

Peer-Reviewed Conference Papers

2022 C. Bamford, M. Jiang, **M. Samvelyan**, T. Rocktäschel, "GriddlyJS: A Web IDE for Reinforcement Learning", In *Thirty-fifth Conference on Neural Information Processing Systems Datasets and Benchmarks Track*, [paper]

2022 E. Hambro, S. Mohanty, D. Babaev, M. Byeon, D. Chakraborty, E. Grefenstette, M. Jiang, D. Jo, A. Kanervisto, J. Kim, S. Kim, R. Kirk, V. Kurin, H. KÃijttler, T. Kwon, D. Lee, V. Mella, N. Nardelli, I. Nazarov, N. Ovsov, J. Parker-Holder, R. Raileanu, K. Ramanauskas, T. Rocktäschel, D. Rothermel, **M. Samvelyan**, D. Sorokin, M. Sypetkowski, M. Sypetkowski, "Insights From the NeurIPS 2021 NetHack Challenge", *Proceedings of the NeurIPS 2021 Competitions and Demonstrations Track, PMLR 176:41-52, 2022*, [paper].

2022 M. Matthews, **M. Samvelyan**, J. Parker-Holder, E. Grefenstette, T. Rocktäschel, "Hierarchical Kickstarting for Skill Transfer in Reinforcement Learning", In **CoLLAs 2022**: *1st Conference on Lifelong Learning Agents*, [paper].

2022 J. Parker-Holder, M. Jiang, M. Dennis, **M. Samvelyan**, J. Foerster, E. Grefenstette, T. Rocktäschel, "Evolving Curricula with Regret-Based Environment Design", In ICML 2022, *Proceedings of the 39th International Conference on Machine Learning* [paper, website].

2021 **M. Samvelyan**, R. Kirk, V. Kurin, J. Parker-Holder, M. Jiang, E. Hambro, F. Petroni, H. Küttler, E. Grefenstette, T. Rocktäschel, "MiniHack the Planet: A Sandbox for Open-Ended Reinforcement Learning Research", In NeurIPS 2021: *Thirty-fifth Conference on Neural Information Processing Systems Datasets and Benchmarks Track*, [paper, blog]

2021 A. Mahajan, **M. Samvelyan**, L. Mao, V. Makoviychuk, A. Garg, J. Kossaifi, S. Whiteson, Y. Zhu, A. Anandkumar, "Tesseract: Tensorised Actors for Multi-Agent Reinforcement Learning", In ICML 2021: *Proceedings of the 38th International Conference on Machine Learning*, [paper].

2019 A. Mahajan, T. Rashid, **M. Samvelyan**, S. Whiteson, "MAVEN: Multi-Agent Variational Exploration", In NeurIPS 2019: *Advances in Neural Information Processing Systems 32*, [paper].

2019 **M. Samvelyan***, T. Rashid*, C. Schroeder de Witt, G. Farquhar, N. Nardelli, T. Rudner, C.-M. Hung, P. Torr, J. Foerster, S. Whiteson, "The StarCraft Multi-Agent Challenge", In AAMAS 2019: *Proceedings of the 18th International Conference on Autonomous Agents and Multiagent Systems*, [paper, blog].

2018 T. Rashid*, **M. Samvelyan***, C. Schroeder, G. Farquhar, J. Foerster, S. Whiteson, "QMIX: Monotonic Value Function Factorisation for Deep Multi-Agent Reinforcement Learning", In ICML 2018: *Proceedings of the 35th International Conference on Machine Learning*, [paper].

2015 S. Avetisyan, **M. Samvelyan**, M. Karapetyan, "Random Irregular Block-hierarchical Networks: Algorithms For Computation of Main Properties", In *Proceedings of the 9th Annual Scientific Conference at RAU*, [paper].

Workshop Papers

2022 **M. Samvelyan**, A. Khan, M. Dennis, M. Jiang, J. Parker-Holder, J. Foerster, R. Raileanu, T. Rocktäschel, "Maestro: Open-Ended Environment Design for Multi-Agent Reinforcement Learning", In *Deep Reinforcement Learning Workshop,* NeurIPS 2022.

2022 M. Matthews, **M. Samvelyan**, J. Parker-Holder, E. Grefenstette, T. Rocktäschel, "Skill-Hack: A Benchmark for Skill Transfer in Open-Ended Reinforcement Learning!", In *Workshop on Agent Learning in Open-Endedness,* ICLR 2022.

2021 J. Parker-Holder, M. Jiang, M. Dennis, **M. Samvelyan**, J. Foerster, E. Grefenstette, T. Rocktäschel, "That Escalated Quickly: Compounding Complexity by Editing Levels at the Frontier of Agent Capabilities", In *Deep Reinforcement Learning Workshop,* NeurIPS 2021.

2021 A. Mahajan, **M. Samvelyan**, L. Mao, V. Makoviychuk, A. Garg, J. Kossaifi, S. Whiteson, Y. Zhu, A. Anandkumar, "Reinforcement Learning in Factored Action Spaces using Tensor Decompositions", In *Workshop on Quantum Tensor Networks in Machine Learning,* NeurIPS 2021.

2019 **M. Samvelyan***, T. Rashid*, C. Schroeder de Witt, G. Farquhar, N. Nardelli, T. Rudner, C.-M. Hung, P. Torr, J. Foerster, S. Whiteson, "The StarCraft Multi-Agent Challenge", In *Deep Reinforcement Learning Workshop,* NeurIPS 2019.

Preprints

2022 B. Ellis, S. Moalla, **M. Samvelyan**, M. Sun, A. Mahajan, S. Whiteson, "SMACv2: An Improved Benchmark for Cooperative Multi-Agent Reinforcement Learning", Preprint, [paper].

2022 A. Mahajan, **M. Samvelyan**, T. Gupta, B. Ellis, M. Sun, T. Rocktäschel, S. Whiteson, "Generalization in Cooperative Multi-Agent Systems", Preprint, [paper].

* equal contribution

Blogposts

2021 **MiniHack: A New Sandbox for Open-Ended Reinforcement Learning**.
Facebook AI Research Blog, [link].

2019 **Solving AI Challenges by Playing StarCraft**.
NVIDIA Developer Blog, [link].

2019 **SMAC: The StarCraft Multi-Agent Challenge**.
WhiRL Blog, University of Oxford, [link].

Languages

Native	Armenian
Fluent	English
Fluent	Russian
Elementary	German