

# Mikayel Samvelyan

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## Curriculum Vitae

### Education

- 2020 – 2023 **University College London, United Kingdom.**
  - PhD in Computer Science
  - Adviser: Tim Rocktäschel
  - In collaboration with Facebook AI Research
- 2016 – 2017 **University of Oxford, United Kingdom.**
  - MSc in Computer Science
  - Thesis: Factored Value Functions for Deep Multi-Agent Reinforcement Learning
  - Adviser: 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 **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

- 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)

### 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

- 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", To appear: *NeurIPS 2021: 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

- 2021 J. Parker-Holder, M. Jiang, M. Dennis, **M. Samvelyan**, I. Korshunova, 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.

\* equal contribution

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## Open-Source Repositories

- 2021 **MiniHack**, [github.com/facebookresearch/minihack](https://github.com/facebookresearch/minihack).  
A sandbox framework for open-ended reinforcement learning research.
- 2019 **SMAC**, *StarCraft Multi-Agent Challenge*, [github.com/oxwhirl/smac](https://github.com/oxwhirl/smac).  
A benchmark for cooperative multi-agent reinforcement learning research based on StarCraft II.
- 2019 **PyMARL**, [github.com/oxwhirl/pymarl](https://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](https://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..

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## Professional Service

### Competitions

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

### Reviewing

2021, 2022 International Conference on Learning Representations, ICLR

2021 International Conference on Machine Learning, ICML

2021 Neural Information Processing Systems, NeurIPS

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

### Application Evaluations

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

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## Supervision

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

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

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## 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**.  
Whiteson Research Lab Blog, University of Oxford, [link].

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## Invited Talks

2020 **Monotonic Value Function Factorisation for Deep Multi-Agent Reinforcement Learning**, *University College London, UK*.  
Invited talk at the UCL Artificial Intelligence Society Journal Club.

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## Teaching Experience

**University College London**, *Department of Computer Science*.

- 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)