ROBERTA RAILEANU

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RESEARCH INTERESTS

Deep Reinforcement Learning, Generalization, Lifelong Learning, Open-Ended Learning

CURRENT POSITION

Meta AI Research (FAIR), London, UK Oct 2021 - Present

EDUCATION

New York University, NY, USA Sep 2016 - Sep 2021
PhD in Computer Science
Thesis: Towards More General and Adaptive Reinforcement Learning Agents
Advisor: Rob Fergus

Princeton University, NJ, USA Sep 2012 - June 2016
A.B. in Astrophysical Sciences, *magna cum laude*
Certificates (Minors): Statistics and Machine Learning, Applications of Computing
Thesis: Clustering Redshift Estimation for the Hyper Suprime-Cam Survey
Advisor: Michael Strauss

PUBLICATIONS

Mu J, Zhong V, **Raileanu R**, Jiang M, Goodman N, Rocktäschel T, Grefenstette E, Improving Intrinsic Exploration with Language Abstractions, *under review*, 2022.

Open Ended Learning Team, Stooke A, Mahajan A, Barros C, Deck D, Bauer J, Sygnowski J, Trebacz M, Jaderberg M, Mathieu M, McAleese N, Bradley-Schmieg N, Wong N, Porcel N, **Raileanu R**, Hughes-Fitt S, Dalibard V, Czarnecki W, Open-Ended Learning Leads to Generally Capable Agents, *under review*, 2021.

Raileanu R, Fergus R, Decoupling Value and Policy for Generalization in Reinforcement Learning, *ICML*, 2021 (**oral**).

Raileanu R, Goldstein M, Yarats D, Kostrikov I, Fergus R, Automatic Data Augmentation for Generalization in Deep Reinforcement Learning, *NeurIPS*, 2021 and *Inductive Biases, Invariances, and Generalization in Reinforcement Learning Workshop*, *ICML*, 2020 (**oral**).

Campero A, **Raileanu R**, Heinrich K, Tenenbaum J, Rocktäschel T, Grefenstette E, Learning with AMIGo: Adversarially Motivated Intrinsic Goals, *ICLR*, 2021.

Raileanu R, Goldstein M, Szlam A, Fergus R, Fast Adaptation to New Environments via Policy-Dynamics Value Functions, *ICML* 2020 and *Beyond "Tabula Rasa" in Reinforcement Learning Workshop*, *ICLR*, 2020 (**oral**).

Raileanu R, Rocktäschel T, RIDE: Rewarding Impact-Driven Exploration for Procedurally-Generated Environments, *ICLR*, 2020.

Heinrich K, Nardelli N, Miller A, **Raileanu R**, Selvatici M, Grefenstette E, Rocktäschel T, The NetHack Learning Environment, *NeurIPS*, 2020.

Resnick C*, **Raileanu R***, Kapoor S, Peysakhovich A, Cho K, Bruna J, Backplay: "Man Muss Immer Umkehren", *Reinforcement Learning in Games Workshop*, *AAAI*, 2019.

Raileanu R, Denton E, Szlam A, Fergus R, Modeling Others using Oneself in Multi-Agent Reinforcement Learning, *ICML*, 2018.

Raileanu R, Szlam A, Fergus R, Modeling Other Agents' Hidden States in Deep Reinforcement Learning, *Emergent Communication Workshop*, *NeurIPS*, 2017.

Kim CK, Ostriker EC, **Raileanu R**, Superbubbles in the Multiphase ISM and the Loading of Galactic Winds, *The Astrophysical Journal*, 2016.

RESEARCH EXPERIENCE

DeepMind, London, UK Jan 2021 - Jun 2021
Research Intern

Researched unsupervised environment design methods for generalization in 3D environments.
Advisor: Max Jaderberg

Facebook AI Research, London, UK June - Sep 2019
Research Intern

Developed a new algorithm for exploration in sparse reward procedurally-generated environments.
Advisor: Tim Rocktäschel

Microsoft Research, Cambridge, UK June - Aug 2018
Research Intern

Researched methods for zero-shot and few-shot generalization in multi-agent settings.
Advisors: Katja Hofmann, Sam Devlin

Facebook AI Research, New York, USA June - Aug 2017
Research Intern

Researched methods for modeling other agents in semi-cooperative reinforcement learning settings.
Advisor: Arthur Szlam

Princeton University, Princeton, USA June - Aug 2015
Undergraduate Researcher

Developed 3D hydrodynamical simulations of supernovae in the multiphase interstellar medium.
Advisors: Eve Ostriker, Chang-Goo Kim

Princeton University, Princeton, USA Feb - May 2015
Undergraduate Researcher

Implemented and evaluated machine learning techniques for the prediction of stellar rotation periods.
Advisor: Timothy Morton

ETH, Zürich, Switzerland Jun - Aug 2014
Research Intern

Created Monte Carlo simulations for exoplanet detection with the James Webb Space Telescope.
Advisor: Michael Meyer

Max Planck for Extraterrestrial Physics, Garching, Germany Jun - Aug 2013
Research Intern

Developed N-Body simulations and theoretical models of the Milky Way Galaxy.
Advisor: Ortwin Gerhard

HONORS & AWARDS

Rising Stars in EECS	2020
Sigma Xi: Scientific Research Honor Society	2016
Bell Burnell Award for Early Career Female Physicist	2013
Bronze Medal at the International Physics Olympiad	2012
Silver Medal at the International Physics Olympiad	2011
Gold Medal at the International Astrophysics Olympiad	2011
Silver Medal at Tuymaada International Olympiad in Physics	2010

INVITED TALKS

AI and Games Summer School	Aug 2022
Imperial ICARL Seminar	May 2022
Microsoft Research Summit	Aug 2021
Princeton Intelligent Robot Motion Lab	Mar 2021
Berkeley Rising Stars EECS	Nov 2020
NYU Game Innovation Lab	Jul 2020

MENTORING EXPERIENCE

Ishita Mediratta, AI Residency Project, Meta AI - *underfitting in reinforcement learning*	2022
Minqi Jiang, PhD Project, Meta AI - *lifelong reinforcement learning*	2022
Mikayel Samvelyan, PhD Project, Meta AI - *environment design for multi-agent learning*	2022
Yingchen Xu, PhD Project, Meta AI - *self-supervised reinforcement learning*	2022
Edoardo Cetin, PhD Project, Imperial - *multi-task reinforcement learning*	2022
Jean-Baptiste Gaya, PhD Project, Meta AI - *continual reinforcement learning*	2022
Jesse Mu, Internship Project, Meta AI - *language and exploration*	2021
Aaron Roth, PhD Project, UMD (now US Naval Research Lab) - *representation learning*	2020
Chang Ye, MS Project, NYU (now Google) - *adaptation to new environments*	2020
Srikar Yellapragada, MS Thesis, NYU (now Stony Brook) - *reinforcement learning for translation*	2019
Chandra Konkimalla, MS Project, NYU (now Amazon) - *learning from demonstrations*	2019
Zeping Zhan, MS Project, NYU (now Kooick) - *multi-agent learning in social dilemmas*	2019

REVIEWING EXPERIENCE

2022: ICML, ICLR GMS Workshop, European Workshop on RL
2021: ICLR, ICML, NeurIPS
2020: ICLR, ICML, NeurIPS, UAI, ICML LAOW Workshop, IEEE
2019: ICLR, ICML, NeurIPS, ICML I3 Workshop
2018: ICLR, ICML, NeurIPS

ORGANIZING EXPERIENCE

Agent Learning in Open-Endedness (ALOE) Workshop at ICLR 2022
Unsupervised Reinforcement Learning (URL) Workshop at ICML 2021

TEACHING EXPERIENCE

African Master's of Machine Intelligence (AMMI), Kigali, Rwanda – NLP	March 2019
Princeton McGraw Center, New Jersey, USA – Math, Physics	2015 - 2016

RELEVANT SKILLS

PyTorch, JAX, Tensorflow, Python, Java, Matlab, R, C++, OCaml