

# ROBERTA RAILEANU

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## RESEARCH INTERESTS

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Deep Reinforcement Learning, Generalization, Adaptation

## EDUCATION

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New York University, NY, USA

Sep 2016 - Present

PhD Candidate in Computer Science

Advisor: Rob Fergus

Princeton University, NJ, USA

Sep 2012 - June 2016

A.B. in Astrophysical Sciences, *magna cum laude*

Certificates: Statistics and Machine Learning, Applications of Computing

Thesis: Clustering Redshift Estimation for the Hyper Suprime-Cam Survey

Advisor: Michael Strauss

## PUBLICATIONS

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**Raileanu R**, Fergus R, Decoupling Value and Policy for Generalization in Reinforcement Learning, *preprint*, 2021.

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, Yarats D, Kostrikov I, Fergus R, Automatic Data Augmentation for Generalization in Deep Reinforcement Learning, **oral** at *Inductive Biases, Invariances, and Generalization in Reinforcement Learning Workshop, ICML*, 2020.

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

**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, NIPS*, 2017.

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

## RESEARCH EXPERIENCE

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**DeepMind, London, UK**

Jan 2021 - Jun 2021

*Research Intern*

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

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Rising Stars in EECS	2020
Microsoft Research AI Breakthroughs	2020
Finalist of the Open Phil AI Fellowship	2019
Sigma Xi: Scientific Research Honor Society	2016
Bell Burnell Award for Early Career Female Physicist	2013
Silver and Bronze Medals at the International Physics Olympiad	2011, 2012
Gold Medal at the International Astrophysics Olympiad	2011
Silver Medal at Tuymaada International Olympiad in Physics	2010

## REVIEWING EXPERIENCE

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2021: ICML  
2020: ICLR, UAI, NeurIPS, ICML LAOW Workshop, IEEE  
2019: ICLR, ICML, NeurIPS, ICML I3 Workshop  
2018: ICLR, ICML

## MENTORING EXPERIENCE

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Aaron Roth, PhD Project, UMD - <i>representation learning for reinforcement learning</i>	2020
Chang Ye, MS Project, NYU - <i>generalization and adaptation to new environments</i>	2020
Srikar Yellapragada, MS Thesis, NYU (now Bloomberg) - <i>reinforcement learning for translation</i>	2019
Chandra Konkimalla, MS Project, NYU (now Amazon) - <i>learning from demonstrations</i>	2019
Zeping Zhan, MS Project, NYU (now Kooick) - <i>multi-agent learning in social dilemmas</i>	2019

## REVIEWING EXPERIENCE

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2020: ICLR, UAI, NeurIPS, ICML LAOW Workshop, IEEE  
2019: ICLR, ICML, NeurIPS, ICML I3 Workshop  
2018: ICLR, ICML

## TEACHING EXPERIENCE

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African Master's of Machine Intelligence (AMMI), Kigali, Rwanda	March 2019
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## RELEVANT SKILLS

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PyTorch, Tensorflow, Lua Torch, Python, Java, Matlab, R, C++, OCaml