

Jacob Beck

Research Scientist

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Education

- Class of 2025 **University of Oxford, United Kingdom, DPhil**, Computer Science, Meta-Reinforcement Learning, Multi-Agent Reinforcement Learning, In-Context Learning.
Advisor: Prof. Shimon Whiteson
- Class of 2020 **Brown University, United States, M.S.**, Computer Science, **4.0 GPA**, Human Feedback, Game Theory, Autonomous Vehicles, Reinforcement Learning.
Advisor: Prof. Michael Littman, *Thesis*
- Class of 2018 **Brown University, United States, B.S.**, Computer Science, **3.8 GPA**.
Scholarships
- 2020 – 2024 **2020 Google DeepMind Doctoral Scholarship**

Experience

Full-Time

- Spring 2025 **Oracle, Research Scientist**,
– **Present**
- Conducting research on agentic systems in the *Machine Learning Research Group*
 - Designed pipelines for fine-tuning reasoning in coding agents with reinforcement learning
 - Applied OpenAI Evolutionary Strategies for test-time training of a 20B-parameter model
 - Developed a unified abstraction for agentic scaffolds, search, and evolution with LLMs.

Extended Positions

- Spring 2019 **Microsoft Research, Predoc**, Advisor: Katja Hofmann, *Brown's Blog*, *MSR's Blog*,
– Fall 2019
- Researched long-term memory in deep RL, with first author publication at ICLR 2020
 - Showed the sensitivity of modern memory approaches to stochasticity in RL
 - Implemented DNC and improved over it by 9%.
- Fall 2017 **Brown University Self-Driving Car Lab, Student Researcher**, Advisor: Michael Littman,
– Fall 2020
- Led research on learning from human demonstration with human feedback (*New Scientist*)
 - Used Stackelberg game trees for human interaction, with a publication at ICSR 2019
 - Created DQN to plan actions for an autonomous car in Unity.

Internships

- Summer 2024 **InstaDeep, PhD Research Intern**,
- Led research on large language models (LLMs) for protein fitness prediction
 - Applied foundation models, in-context learning over related tasks, and fine-tuning
 - Published the meta-learning method, *Metalic*, achieving state-of-the-art results on ProteinGym.
- Fall 2018 **DeepScale, R&D Intern**,
- Created state-of-the-art methods for lane instance segmentation using PyTorch
 - Developed heuristic, cluster-based, and end-to-end approaches based on ShuffleNet.

- Summer 2018 **Lyft, Software Engineer Intern,**
- Worked on behavioral planning at the Level5 autonomous vehicle lab
 - Simulated human agents at a stop intersection in C++
 - Coded an MDP, and solver, to find a policy for AV at a stop intersection.
- Summer 2017 **Adobe, Data Science Intern,**
- Improved forecasting for the Data Science Digital Marketing research team
 - Set up the models to re-train online as new data comes in (concurrently)
 - Improved team's prediction accuracy by 9%, with only 121 samples per model.
- Summer 2015 **Pied Piper Robotics LLC, Engineering Intern,**
- Designed, 3D printed, programmed, and wired a robot head and neck, using ROS.

Journal Publications

- 2025 A Tutorial on Meta-Reinforcement Learning
Jacob Beck*, Risto Vuorio*, Evan Zheran Liu, Zheng Xiong, Luisa Zintgraf, Chelsea Finn, and Shimon Whiteson
Foundations and Trends in Machine Learning

Conference Publications

- 2025 Offline RLAIFF: Piloting VLM Feedback for RL via SFO
Jacob Beck
RLC Workshop on RL Beyond Rewards: Ingredients for Developing Generalist Agents
- 2025 Metalic: Meta-Learning In-Context with Protein Language Models
Jacob Beck, Shikha Surana, Manus McAuliffe, Oliver Bent, Thomas D Barrett, Juan Jose Garau Luis, and Paul Duckworth
International Conference on Learning Representations
- 2024 SplAgger: Split Aggregation for In-Context Reinforcement Learning
Jacob Beck, Matthew Jackson, Risto Vuorio, Zheng Xiong, and Shimon Whiteson
Reinforcement Learning Conference
- 2024 Distilling Morphology-Conditioned Hypernetworks for Efficient Universal Morphology Control
 Zheng Xiong, Risto Vuorio, **Jacob Beck**, Matthieu Zimmer, Kun Shao, and Shimon Whiteson
International Conference on Machine Learning
- 2023 Recurrent Hypernetworks are Surprisingly Strong in Meta-RL
Jacob Beck, Risto Vuorio, Zheng Xiong, and Shimon Whiteson
Neural Information Processing Systems
- 2023 Universal Morphology Control via Contextual Modulation
 Zheng Xiong, **Jacob Beck**, and Shimon Whiteson
International Conference on Machine Learning
- 2023 Trust Region Bounds for Decentralized PPO Under Non-stationarity
 Mingfei Sun, Sam Devlin, **Jacob Beck**, Katja Hofmann, and Shimon Whiteson
Autonomous Agents and Multiagent Systems (Best Paper Award)
- 2022 Hypernetworks in Meta-Reinforcement Learning
Jacob Beck, Matthew Jackson, Risto Vuorio, and Shimon Whiteson
Conference on Robot Learning
- 2021 On the Practical Consistency of Meta-Reinforcement Learning Algorithms
 Zheng Xiong, Luisa Zintgraf, **Jacob Beck**, Risto Vuorio, and Shimon Whiteson
NeurIPS Meta-Learning Workshop

*Contributed equally

- 2021 No DICE: An Investigation of the Bias-Variance Trade off in Meta-Gradients
Risto Vuorio, **Jacob Beck**, Gregory Farquhar, Jakob Foerster, and Shimon Whiteson
NeurIPS Deep RL Workshop
- 2020 Stackelberg Punishment and Bully-Proofing Autonomous Vehicles
Matt Cooper, Jun Ki Lee, **Jacob Beck**, Joshua D. Fishman, Michael Gillett,
Zoë Papakipos, Aaron Zhang, Jerome Ramos, Aansh Shah, and Michael L. Littman
International Conference on Social Robotics
- 2020 AMRL: Aggregated Memory For Reinforcement Learning
Jacob Beck, Kamil Ciosek, Sam Devlin, Sebastian Tschiatschek, Cheng Zhang, and
Katja Hofmann
International Conference on Learning Representations

Academic Services

Speaker

- 2024 **ICML Panel, Auto-RL**, *Panelist*,
Invited to speak on a *workshop panel* about meta-learning, auto-ML, and LLMs at ICML.
- 2024 **Meta-RL Tutorial**, *Presenter*,
Presented a *tutorial* on meta-reinforcement learning at AAAI 2024.
- 2023 **TalkRL Podcast**, *Interview*,
Interviewed on the *TalkRL Podcast* to explain meta-reinforcement learning.
- 2023 **Meta-RL Tutorial**, *Presenter*,
Presented a *tutorial* on meta-reinforcement learning at AutoML 2023.
- 2021 **ICLR Panel, Philosophy and AGI**, *Organizer*,
Organized two *panels* on the the technical and philosophical problems of AGI.

Reviewer

- 2025 **Transactions on Machine Learning Research**, *Reviewer*.
- 2025 **Reinforcement Learning Conference**, *Reviewer*.
- 2025 **International Conference on Learning Representations**, *Reviewer*.
- 2023 **Neural Information Processing Systems**, *Top Reviewer*.
- 2022 **NeurIPS Deep RL Workshop**, *Reviewer*.
- 2022 **International Conference on Machine Learning**, *Reviewer*.
- 2020 **Nature Communications**, *Reviewer*.

Teaching and Supervision

- Spring, 2022 **Supervisor**, *University of Oxford*,
Matthew Jackson, Hypernetworks in meta-reinforcement learning.
- Fall, 2021 **Co-Supervisor**, *University of Oxford*,
Zheng Xiong, On the practical consistency of meta-reinforcement learning algorithms.
- Fall, 2017 **Deep Learning Teaching Assistant**, *Brown University*,
 - Designed, taught, graded material for the graduate deep learning course, CSCI 2470
 - Gave a lecture on implementing sequence-to-sequence translation with attention
 - Designed a lab on recurrent neural networks.