Matthew T. Jackson

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Summary

My goal is to develop general-purpose agents. During my PhD, I have focused on world models, primarily using diffusion and video data, as well as offline reinforcement learning and meta-learned algorithms. I have developed ML systems throughout my career, working as a research scientist on autonomous vehicles and as a software engineer on both applications and infrastructure. I am currently seeking internship and full-time research scientist roles, starting as early as March 2025.

Education

University of Oxford – DPhil in Engineering Science 2021-Sept 2025

Topics: Diffusion, Video Models, Offline and Meta Reinforcement Learning
Member of the AIMS CDT – supervised by Jakob Foerster and Shimon Whiteson.

University College London – MSc in Machine Learning 2020-2021

"Model-Based Task Inference for Meta-Reinforcement Learning"
Distinction, 87% – Dean's List.
Supervised by Tim Rocktäschel and Edward Grefenstette.

University of Cambridge – BA in Computer Science 2017-2020

"Real-Time Video Super-Resolution"
First-Class Honors, 86% – Senior Scholar, ranked 2/99 in cohort.
Highly Commended (top 5) Dissertation – supervised by Pietro Liò.

Experience

Wayve – Research Scientist Intern May-Oct 2024

Working in the World Models Team on GAIA, a generative vision-language-action (VLA) model for self-driving. Completed projects on offline reinforcement learning, interpretability, and multimodal video generation.

Amazon – Software Engineering Intern 2020

Worked in the Alexa Knowledge Group, developing Java software to rank natural language answers to user questions. Implemented features running on all Alexa Q&A queries.

Arm – Software Engineering Intern 2019

Worked in the Machine Learning Software Group, developing Arm's neural network inference engines in C++. Reviewed deep learning research and added support for new architectures. A selection of contributions may be found on the ArmNN GitHub.

Cubica Technology (acquired) – Software Engineering Intern 2018

Developed a Python tool to identify and label reoccurring identities across large-scale video databases. Implemented random forest and tracking methods for video summarization.

Selected Publications

Policy-Guided Diffusion
Matthew T. Jackson, Michael T. Matthews, Cong Lu, Benjamin Ellis, Shimon Whiteson, Jakob Foerster
RLC 2024 (Oral presentation) [GitHub (114 stars)] [ArXiv]

Discovering Temporally-Aware Reinforcement Learning Algorithms
Matthew T. Jackson*, Chris Lu*, Louis Kirsch, Robert T. Lange, Shimon Whiteson, Jakob Foerster
ICLR 2024 [Podcast] [ArXiv]

Discovering General Reinforcement Learning Algorithms with Adversarial Environment Design
Matthew T. Jackson, Minqi Jiang, Jack Parker-Holder, Risto Vuorio, Chris Lu, Gregory Farquhar, Shimon Whiteson, Jakob Foerster
NeurIPS 2023 [GitHub (22 stars)] [ArXiv]

Software

Languages
Python, C++, Java, OCaml, SML, HTML/CSS, Bash

Frameworks
JAX, PyTorch, Bootstrap

Academia

Tutor

Reinforcement Learning (PhD course), Machine Learning (Master's course)

Reviewer

ICLR, ICML (AutoRL), NeurIPS (DeepRL, ALOE, Diffusion Models), DMLR, ACML, Frontiers

Further Publications

2024 [Scholar]

Jafar: An Open-Source Genie Reimplementation in Jax
Timon Willi*, **Matthew T. Jackson***, Jakob Foerster
ICML 2024 Workshop on Controllable Video Generation [GitHub (26 stars)] [ArXiv]

Near to Mid-term Risks and Opportunities of Open Source Generative AI
Francisco Eiras, Aleksandar Petrov, Bertie Vidgen, Christian Schroeder de Witt, Fabio Pizzati, Katherine Elkins, Supratik Mukhopadhyay, Adel Bibi, Botos Csaba, Fabro Steibel, Fazl Barez, Genevieve Smith, Gianluca Guadagni, Jon Chun, Jordi Cabot, Joseph Marvin Imperial, Juan A. Nolazco-Flores, Lori Landay, **Matthew T. Jackson**, Paul Rottger, Philip Torr, Trevor Darrell, Yong Suk Lee, Jakob Foerster
ICML 2024 (Oral) [ArXiv]

Craftax: A Lightning-Fast Benchmark for Open-Ended Reinforcement Learning
Michael T. Matthews, Michael Beukman, Benjamin Ellis, Mikayel Samvelyan, **Matthew T. Jackson**, Samuel Coward, Jakob Foerster
ICML 2024 (Spotlight) [ArXiv]

Towards Addressing Non-stationarity, Plasticity Loss, and Exploration via Learned Optimizers
Alexander D. Goldie, Chris Lu, **Matthew T. Jackson**, Shimon Whiteson, Jakob Foerster
ICML 2024 Workshop on Automated Reinforcement Learning (Spotlight) [ArXiv]

SplAgger: Split Aggregation for In-Context Reinforcement Learning
Jake Beck, **Matthew T. Jackson**, Risto Vuorio, Zheng Xiong, Shimon Whiteson
RLC 2024 [ArXiv]

Retrieve What You Need: A Mutual Learning Framework for Open-domain Question Answering
Dingmin Wang, Qiuyuan Huang, **Matthew T. Jackson**, Jianfeng Gao
TACL 2024 [ArXiv]

Reinforcement Learning Controllers for Soft Robots Using Learned Environments
Uljad Berdica, **Matthew T. Jackson**, Niccolò E. Veronese, Jakob Foerster, Perla Maiolino
RoboSoft 2024 [ArXiv]

2022

Hypernetworks for Meta-Reinforcement Learning
Jake Beck, **Matthew T. Jackson**, Risto Vuorio, Shimon Whiteson
CoRL 2022 [ArXiv]

Multi-Modal Fusion by Meta-Initialization
Matthew T. Jackson*, Shreshth Malik*, Michael T. Matthews, Yousuf Mohamed-Ahmed
FARSCOPE Robotics Workshop 2022 (Best Poster Award) [ArXiv]

Preprints

Adam on Local Time: Addressing Non-Stationarity in RL with Relative Adam Timesteps
Benjamin Ellis*, **Matthew T. Jackson***, Andrei Lupu, Alexander D. Goldie, Mattie Fellows, Shimon Whiteson, Jakob Foerster
Under Review [ArXiv]