Marc Rigter

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EDUCATION

University of Oxford　　　　　　　　　　　　　　　　　　Oct. 2018 – Jan. 2023
Doctor of Philosophy in Information Engineering
No corrections
Thesis: "Risk-Sensitive and Robust Model-Based Reinforcement Learning and Planning"
Advisors: Prof. Nick Hawes and Dr. Bruno Lacerda
Examiners: Prof. Jakob Foerster and Prof. Aviv Tamar

University of Sydney　　　　　　　　　　　　　　　　　　Feb. 2014 – Jan. 2018
Bachelor of Engineering (Aerospace and Control)
First Class Honours and University Medal (1st in cohort)
Honours thesis at NASA Jet Propulsion Laboratory supervised by Dr. Rob Reid and Dr. Benjamin Morrell

EXPERIENCE

Microsoft Research　　　　　　　　　　　　　　　　　　Jan. 2024 – present
Postdoctoral Researcher　　　　　　　　　　　　　　　　*Cambridge, United Kingdom*

- Responsible for conducting research on large language models and deep reinforcement learning.

Applied AI Lab, University of Oxford　　　　　　　　　　Jan. 2023 – Jan. 2024
Postdoctoral Researcher　　　　　　　　　　　　　　　　*Oxford, United Kingdom*

- Responsible for conducting research on model-based reinforcement learning and generative models, as well as co-supervising PhD students.

JP Morgan AI Research　　　　　　　　　　　　　　　　Apr. 2021 – Oct. 2021
Research Scientist Intern　　　　　　　　　　　　　　　　*London, United Kingdom*

- Led project on the use of Markov decision processes for optimal monitoring of fraudulent transactions. Completed proof of concept on real transaction data and published novel method in AAAI.
- Improved schedule optimisation for the return to office following the Covid-19 pandemic.

Thomas Global Systems　　　　　　　　　　　　　　　　Apr. 2018 – Aug. 2018
Software Engineer　　　　　　　　　　　　　　　　　　　*Sydney, Australia*

- Developed prototypes for avionics software, including data-driven calibration of avionics displays.

NASA Jet Propulsion Laboratory　　　　　　　　　　　　Jul. 2017 – Dec. 2017
Visiting Researcher　　　　　　　　　　　　　　　　　　*Los Angeles, USA*

- Developed machine-learning approach to automatically tune quadrotors for high speed flight.
- Approach demonstrated on real autonomous quadrotor system and published at IROS.

18. *Reward-Free Curricula for Training Robust World Models.*
    International Conference on Learning Representations (**ICLR**), 2024.
    M. Rigter, M. Jiang, I. Posner

17. *World Models via Policy-Guided Trajectory Diffusion.*
    Preprint arXiv:2312.08533, 2024.
    M. Rigter, J. Yamada, I. Posner

16. *TWIST: Teacher-Student World Model Distillation for Efficient Sim-to-Real Transfer .*
    Preprint arXiv:2312.08533, 2024.
    J. Yamada, **M. Rigter**, J. Collins, I. Posner

15. *Risk-sensitive and robust model-based reinforcement learning and planning.*
    PhD thesis, University of Oxford, 2023.
    M. Rigter

14. *One risk to rule them all: A risk-sensitive perspective on model-based offline reinforcement learning.*
    Advances in Neural Information Processing Systems (**NeurIPS**), 2023.
    M. Rigter, B. Lacerda, N. Hawes

13. *Risk-constrained planning for multi-agent systems with shared resources.*
    International Conference on Autonomous Agents and Multiagent Systems (**AAMAS**), 2023.
    Anna Gautier, **Marc Rigter**, Bruno Lacerda, Nick Hawes, and Michael Wooldridge

12. *Planning with hidden parameter polynomial MDPs.*
    AAAI Conference on Artificial Intelligence (**AAAI**), 2023.
    C. Costen, **M. Rigter**, B. Lacerda, N. Hawes

11. *RAMBO-RL: Robust adversarial model-based offline reinforcement learning.*
    Advances in Neural Information Processing Systems (**NeurIPS**), 2022.
    M. Rigter, B. Lacerda, N. Hawes

10. *Planning for risk-aversion and expected value in MDPs.*
    International Conference on Automated Planning and Scheduling (**ICAPS**), 2022.
    Best paper award runner-up.
    M. Rigter, P. Duckworth, B. Lacerda, N. Hawes

9. *Shared autonomy systems with stochastic operator models.*
   International Joint Conference on Artificial Intelligence (**IJCAI**), 2022.
   C. Costen, **M. Rigter**, B. Lacerda, N. Hawes

8. *Optimal admission control for multiclass queues with time-varying arrival rates via state abstraction.*
   AAAI Conference on Artificial Intelligence (**AAAI**), 2022.
   M. Rigter, D. Dervovic, P. Hassanzadeh, J. Long, P. Zehtabi, D. Maggazeni

7. *Risk-averse Bayes-adaptive reinforcement learning.*
   Advances in Neural Information Processing Systems (**NeurIPS**), 2021.
   M. Rigter, B. Lacerda, N. Hawes

6. *Minimax regret optimisation for robust planning in uncertain Markov decision processes.*
   AAAI Conference on Artificial Intelligence (**AAAI**), 2021.
   M. Rigter, B. Lacerda, N. Hawes

5. *A framework for learning from demonstration with minimal human effort.*
   Robotics and Automation Letters (**RAL**), 2020.
   M. Rigter, B. Lacerda, N. Hawes

4. *Robot path planning for multiple target regions.*
   European Conference on Mobile Robots (**ECMR**), 2019.
   S. Ishida, **M. Rigter**, N. Hawes

3. *An autonomous quadrotor system for robust high-speed flight through cluttered environments without GPS.*
   International Conference on Intelligent Robots and Systems (**IROS**), 2019.
   M. Rigter, B. Morrell, R. Reid, G. Merewether, T. Tzanetos, V. Rajur, K. Wong, L. Matthies

2. *Comparison of trajectory optimization algorithms for high-speed quadrotor flight near obstacles.*
   IEEE Robotics and Automation Letters (**RAL**), 2018.
   B. Morrell, R. Thakker, G. Merewether, R. Reid, **M. Rigter**, T. Tzanetos, G. Chamitoff

1. *Differential flatness transforms for aggressive quadrotor flight.*
   International Conference on Robotics and Automation (**ICRA**), 2018.
   B. Morrell, **M. Rigter**, G. Merewether, R. Reid, R. Thakker, T. Tzanetos, V. Rajur, G. Chamitoff

Skills

Areas of expertise: (deep) reinforcement learning; deep learning; generative models; planning
Programming languages: Python (proficient); MATLAB (proficient); C++ (intermediate)
Other computer skills: PyTorch; Tensorflow; NumPy; Git; Linux; ROS; Singularity; Slurm

Awards

- *Runner-up for the best paper award*, International Conference on Automated Planning and Scheduling (ICAPS), 2022.

- *Clarendon Scholarship*, flagship postgraduate scholarship at the University of Oxford covering all fees and living expenses, 2018.

- *University Medal*, awarded by the University of Sydney to the top student in each degree program, 2018.

- *University of Sydney Outstanding Achievement Scholarship*, for achieving the highest possible university entrance percentile (99.95th percentile), 2014.

Teaching

University of Oxford   Feb. 2020 – Mar. 2020

Lead Teaching Assistant, Autonomous Intelligent Machines and Systems CDT

- Created the curriculum for a hands-on robotics course for first-year PhD students (~ 30 contact hours). This involved writing example code for localisation, visualisation, planning, and control of a mobile robot.
- Presented the course in 2020. The course materials have been reused for subsequent years.

University of Sydney   Feb. 2015 – May 2017
Tutor, MATLAB programming course
  - Delivered MATLAB tutorials to classes of approximately 20 students.

Supervision

Jun Yamada, PhD student (co-supervised)	2022 – present
Ana Deligny, PhD student (co-supervised)	2022 – present
Clarissa Costen, PhD student (co-supervised)	2021 – 2022
Ivan Belostotskiy, Master's student (co-supervised)	2019 – 2020
Shu Ishida, Master's student (co-supervised)	2018 – 2019

Professional Service

Reviewing

AAAI Conference on Artificial Intelligence (AAAI)	2021*, 2023
Advances in Neural Information Processing Systems (NeurIPS)	2021*, 2022*, 2023
Artificial Intelligence	2022, 2023
Automatica	2021, 2022
IEEE International Conference on Robotics and Automation (ICRA)	2020, 2022
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	2020, 2021
International Conference on Automated Planning and Scheduling (ICAPS)	2021*
International Conference on Autonomous Agents and Multiagent Systems (AAMAS)	2021*

* indicates sub-reviewer

Mentoring

Pembroke College, University of Oxford
  - Academic representative on the college committee (2019 – 2020). Organised the student mentoring program for that academic year.