

DANIEL BEECHEY

Department of Computer Science, University of Bath, United Kingdom

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RESEARCH INTERESTS

Reinforcement learning, interpretable artificial intelligence, alignment, LLMs in reinforcement learning, hierarchical reinforcement learning, bounded rationality, exploration and continual learning.

EDUCATION

Ph.D. in Computer Science

Expected 2026

University of Bath, United Kingdom.

Supervisors: Özgür Şimşek (Computer Science), Emma Carmel (Social Policy)

Thesis: Self-Explaining Continual Reinforcement Learning Agents

M.Res. in Accountable, Responsible and Transparent AI

2022

University of Bath, United Kingdom.

Supervisors: Özgür Şimşek (Computer Science), Emma Carmel (Social Policy)

Dissertation: Explaining Reinforcement Learning with Shapley Values

Grade: Distinction

M.Sc. in Data Science

2021

University of Bath, United Kingdom.

Supervisor: Özgür Şimşek

Dissertation: Autonomous Routing of Printed Circuit Boards with Hierarchical Reinforcement Learning

Grade: Distinction

B.Sc.(Hons) in Mathematics

2020

University of Bath, United Kingdom.

Grade: First Class

WORK EXPERIENCE

Co-Manager of the Bath RL Laboratory, *University of Bath*

2023 - present

Organising lab activities, including weekly lab meetings, research sessions, paper discussions and social events.

Graduate Teaching Assistant, *University of Bath*

2020 - present

Supervised 10 MSc students, Reinforcement Learning, Statistics for Data Science, Software Technologies for Data Science, Programming, Foundations and Connections, Programming and Discrete Mathematics, Mathematical Methods and Applications.

Fixed-Term Lecturer, *University of Bath*

2022 - 2023

Reinforcement Learning (110 M.Sc. students, 29 M.Sc. students).

Supervised 5 M.Sc. students and 2 B.Sc. students.

PUBLICATIONS

Daniel Beechey, Thomas M. S. Smith and Özgür Şimşek

Explaining Reinforcement Learning with Shapley Values

ICML 2023

Toby Lewis-Atwell, Daniel Beechey, Özgür Şimşek and Matthew N. Grayson

Reformulating Reactivity Design for Data-Efficient Machine Learning

ACS Catalysis, 13(20), 2023

AWARDS

University of Bath, Doctoral Recognition Award	<i>2024</i>
Bath Conference of Computer Science, Best Overall Contribution	<i>2023</i>
Inter-CDT Conference on AI, Best Poster	<i>2023</i>

TALKS

How to Explain Reinforcement Learning with Shapley Values	<i>2024</i>
Bath Doctoral Festival of Ideas	
An Introduction to Explainable and Hierarchical Reinforcement Learning	<i>2024</i>
Bath AI Society	
Explaining Reinforcement Learning with Shapley Values	<i>2023</i>
Bath Conference of Computer Science	
Explaining Reinforcement Learning with Shapley Values	<i>2023</i>
Alan Turing Institute Student Presentations	

TECHNICAL SKILLS

Conceptual	Mathematics, statistics and machine learning.
Programming	Excellent Python skills. Experience with R, Matlab and Git.
Libraries	TensorFlow, PyTorch, Matplotlib, NumPy and many other Python libraries.

SERVICE

Co-Organiser of the Bath Reinforcement Learning Workshop	<i>2024 - present</i>
<i>University of Bath</i> , United Kingdom	
The student lead on the organising committee.	
Reviewing	
European Workshop on Reinforcement Learning (EWRL)	<i>2024</i>