DANIEL BEECHEY

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RESEARCH INTERESTS

Reinforcement learning, explaining artificial intelligence, hierarchical reinforcement learning, bounded rationality, continual learning, LLMs in reinforcement 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** *2024*
Bath Conference of Computer Science, **Best Overall Contribution** *2023*
Inter-CDT Conference on AI, **Best Poster** *2023*

TALKS

How to Explain Reinforcement Learning with Shapley Values *2024*
Bath Doctoral Festival of Ideas

An Introduction to Explainable and Hierarchical Reinforcement Learning *2024*
Bath AI Society

Explaining Reinforcement Learning with Shapley Values *2023*
Bath Conference of Computer Science

Explaining Reinforcement Learning with Shapley Values *2023*
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 *2024 - present*
University of Bath, United Kingdom
The student lead on the organising committee.

Reviewing
European Workshop on Reinforcement Learning (EWRL) *2024*