# DANIEL BEECHEY

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## RESEARCH INTERESTS

Reinforcement learning, explainable artificial intelligence, hierarchical reinforcement learning, bounded rationality, lifelong learning

## EDUCATION

**Ph.D in Computer Science** *Expected 2026*
*Univsersity of Bath*, Bath, United Kingdom.
Advisors: Özgür Şimşek (Computer Science), Emma Carmel (Social Policy)
Thesis: How to Explain Reinforcement Learning with Shapley Values

**M.Res. in Accountable, Responsible and Transparent AI** *2022*
*Univsersity of Bath*, Bath, United Kingdom.
Advisors: Özgür Şimşek (Computer Science), Emma Carmel (Social Policy)
Thesis: Explaining Reinforcement Learning with Shapley Values
Grade: Distinction

**M.Sc. in Data Science** *2021*
*Univsersity of Bath*, Bath, United Kingdom.
Advisor: Özgür Şimşek
Thesis: Autonomous Routing of Printed Circuit Boards using Hierarchical Reinforcement Learning
Grade: Distinction

**B.Sc.(Hons) in Mathematics** *2020*
*Univsersity of Bath*, Bath, United Kingdom.
Grade: First Class

## 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

## TALKS

**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

## AWARDS

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|---|---|
| Bath Conference of Computer Science, **Best Overall Contribution** | *2023* |
| Inter-CDT Conference on AI, **Best Poster** | *2023* |

## TEACHING EXPERIENCE

**Fixed-Term Lecturer,** *University of Bath* — *2022 - 2023*

· Lecturer, Reinforcement Learning (MSc level, 110 students) — *2023*
· Lecturer, Reinforcement Learning (MSc level, 29 students) — *2023*
· Supervisor, Dissertations (MSc level, 5 students) — *2022 - 2023*
· Supervisor, Dissertations (BSc level, 2 students) — *2022 - 2023*

**Graduate Teaching Assistant,** *University of Bath* — *2020 - 2023*

· Teaching Assistant, Reinforcement Learning (MSc level) — *2022 - 2023*
· Teaching Assistant, Reinforcement Learning (BSc level) — *2022 - 2023*
· Supervisor, Dissertations (MSc level, 10 students) — *2022*
· Teaching Assistant, Software Technologies for Data Science (MSc level) — *2022*
· Teaching Assistant, Statistics for Data Science (MSc level) — *2022*
· Teaching Assistant, Programming, Foundations and Connections (BSc level) — *2022*
· Teaching Assistant, Programming and Discrete Mathematics (BSc level) — *2021*
· Teaching Assistant, Mathematical Methods and Applications (BSc level) — *2020*

## TECHNICAL SKILLS

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| **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. |