

AIDAN SCANNELL

Robotics & AI Researcher

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aidanscannell



"Robotics & AI Researcher with over 6 years experience developing and implementing cutting-edge machine learning and robotics algorithms. Track record of bringing ideas to life quickly and effectively through object-orientated and functional programming. Experienced leading research teams, fostering collaborations and presenting research findings at top-tier conferences."

SKILLS

Python

PyTorch

JAX

TensorFlow

W&B

hydra

Docker

Slurm

Git

LaTeX

ROS

C++

Reinforcement learning

Deep learning

Embodied AI

Generative AI

Uncertainty quantification

Robotics

EXPERIENCE

Postdoctoral Researcher (with Prof. Joni Pajarinen & Prof. Arno Solin)

Aalto University | Finnish Center for Artificial Intelligence (FCAI)

July 2022 – Ongoing

Helsinki, Finland

Received four-year funding to sit jointly in the Robot Learning Lab and the Machine Learning Group.

- Led a collaboration of 3 PhD students and 2 PIs to develop a Bayesian deep learning method for continual learning and reinforcement learning. Published results at a top-tier ML conference (ICLR).
- Collaborated with 2 PhD students and 2 PIs to develop a method to prevent representation collapse when using self-supervised learning to learn state representations for reinforcement learning. Preprint.
- Experienced with natural language processing (NLP) for learning language-guided robot control policies.
- Supervising PhD/MSc/BSc theses on robotics foundation models, offline-to-online RL, and generative AI for RL.
- Strong leadership skills demonstrated by leading FCAI's "Long-term decision making and transfer between tasks" team.
- Experienced configuring and training large machine learning experiments on HPC clusters.
- Comfortable documenting code (Sphinx), writing unit tests, collaborating, and contributing to open-source code.

Leadership

Lecturing

Supervision

Reinforcement learning

Deep learning

Robotics

Co-lecturer @ Aalto University

Sept 2022 – Ongoing

Helsinki, Finland

- Co-lecturer on (i) advanced course on Gaussian processes and (ii) Reinforcement Learning course.
- Established myself as a confident, enthusiastic and effective teacher, able to engage and develop students' learning.

Lecturing

Communication

Active listening

Teaching

PhD Researcher (Supervisors: Prof. Arthur Richards & Prof. Carl Henrik Ek)

CDT in Future Autonomous and Robotic Systems, University of Bristol/Bristol Robotics Laboratory

Sept 2018 – May 2022

Bristol, UK

Awarded a four-year PhD scholarship including a taught MRes year.

- Synergised methods from machine learning, stochastic differential geometry and reinforcement learning to control quadcopters in uncertain, real-world environments.
- Implemented machine learning algorithms on real-world robotic systems using TensorFlow, JAX and ROS.
- Presented research results at machine learning conferences (AISTATS) and a top-tier robotics conference (ICRA).

Machine learning

Reinforcement learning

Uncertainty quantification

Robotics

Stochastic geometry

Teaching Assistant @ University of Bristol

Sept 2018 – May 2021

Bristol, UK

- Teaching assistant for (i) Machine Learning, (ii) Robotic Systems and (iii) Intelligent Information Systems courses.

RESEARCH EXPERIENCE

Finnish Center for Artificial Intelligence Team Lead -
Long-term decision making and transfer between tasks

Finnish Center for Artificial Intelligence (FCAI)

📅 Sept 2022 - Ongoing 📍 Helsinki, Finland

Leading a 6-person team of reinforcement learning researchers working on problems in the embodied AI domain.

- Created an environment for researchers to form collaborations.
- Effective communicator demonstrated by weekly presentations.
- Investigating generative AI methods for reinforcement learning.
- Coordinating collection of simulation and real-world robot data.
- Supervising 1 masters thesis and 1 group project.

Leadership

Teamwork skills

Embodied AI

Data collection

INVITED TALKS

- Model-based RL, **Cambridge Ellis Unit Summer School on Probabilistic Machine Learning 2024**, 17th July 2024
- Sequential Decision Making - Bayesian Optimization & Model-based RL, **Advanced course on Gaussian processes @ Aalto University**, 8 April 2024
- (Function-space) Laplace Approximation for Bayesian Neural Networks, **National Science Foundation (NSF) Safe RL Team**, 3 Oct 2023
- Neural Networks as Sparse Gaussian processes for Sequential Learning, **International Workshop of Intelligent Autonomous Learning Systems**, 15 Aug 2023, Darmstädter Haus, Austria
- Model-based reinforcement learning under uncertainty: the importance of knowing what you don't know, **Reinforcement Learning course @ Aalto University**, 15 November 2023
- Sequential Decision Making, **Advanced course on Gaussian processes @ Aalto University**, 4 April 2023
- Model based reinforcement learning under uncertainty, **ML at the Cambridge Computer Lab (ML@CL)**, 23 Feb 2023, University of Cambridge
- Synergising Bayesian Inference and Probabilistic Geometries for Robotic Control, **Cognitive Systems Group @ Technical University of Denmark (DTU)**, 18 March 2021

REVIEWING

- International Conference on Neural Information Processing Systems (NeurIPS)
- International Conference on Learning Representations (ICLR)
- International Conference on Machine Learning (ICML)
- (Senior Reviewer) Reinforcement Learning Conference (RLC)
- IEEE Transaction on Pattern Analysis and Machine Intelligence (TPAMI)
- Annual Conference on Learning for Dynamics and Control (L4DC)
- International Conference on Artificial Intelligence and Statistics (AISTATS)
- Conference on Robot Learning (CoRL)
- International Conference on Robotics and Automation (ICRA)
- IEEE Robotics and Automation Letters (RA-L)

EDUCATION

PhD in Robotics and Autonomous Systems

University of Bristol

📅 Sept 2018 - June 2022

PhD Thesis:

- 📖 Bayesian Learning for Control in Multimodal Dynamical Systems

Taught MRes Year:

- First class honours (GPA=4.0/4.0)

Summer Schools:

- Machine Learning Summer School 2019
- Gaussian Process and Uncertainty Quantification Summer School 2019

MEng in Mechanical Engineering

University of Bristol | First Class Honours (GPA=4.0/4.0)

📅 Sept 2012 - June 2016

- Graduated in top 10% of cohort

REFERENCES

Prof. Arno Solin

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Prof. Joni Pajarinen

@ Aalto University

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Prof. Carl Henrik Ek

@ University of Cambridge

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Prof. Arthur Richards

@ University of Bristol

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PUBLICATIONS

Publications

- Mohammadreza Nakhaei, **Aidan Scannell**, and Joni Pajarinen (June 2024). “Residual Learning and Context Encoding for Adaptive Offline-to-Online Reinforcement Learning”. In: *Proceedings of The 6th Annual Conference on Learning for Dynamics and Control*.
- **Aidan Scannell**, Kalle Kujanpää, Yi Zhao, Mohammadreza Nakhaei, Arno Solin, and Joni Pajarinen (July 2024). “Quantized Representations Prevent Dimensional Collapse in Self-predictive RL”. in: *ICML Workshop on Aligning Reinforcement Learning Experimentalists and Theorists (ARLET 2024)*.
- **Aidan Scannell**, Riccardo Mereu, Paul Chang, Ella Tami, Joni Pajarinen, and Arno Solin (May 2024). “Function-space Parameterization of Neural Networks for Sequential Learning”. In: *The Twelfth International Conference on Learning Representations (ICLR)*.
- **Aidan Scannell**, Carl Henrik Ek, and Arthur Richards (Apr. 2023). “Mode-constrained Model-based Reinforcement Learning via Gaussian Processes”. In: *Proceedings of The 26th International Conference on Artificial Intelligence and Statistics*. Vol. 206. Proceedings of Machine Learning Research. PMLR, pp. 3299–3314.
- **Aidan Scannell**, Riccardo Mereu, Paul Chang, Ella Tami, Joni Pajarinen, and Arno Solin (July 2023). “Sparse Function-space Representation of Neural Networks”. In: *ICML 2023 Workshop on Duality Principles for Modern Machine Learning*.
- **Aidan Scannell** (2022). “Bayesian Learning for Control in Multimodal Dynamical Systems”. PhD thesis. University of Bristol.
- **Aidan Scannell**, Carl Henrik Ek, and Arthur Richards (June 2021). “Trajectory Optimisation in Learned Multimodal Dynamical Systems Via Latent-ODE Collocation”. In: *2021 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE.

Preprints (Under Review)

- **Aidan Scannell**, Kalle Kujanpää, Yi Zhao, Mohammadreza Nakhaei, Arno Solin, and Joni Pajarinen (July 2024). “iQRL - Implicitly Quantized Representations for Sample-efficient Reinforcement Learning”. In: arXiv: 2406.02696 [cs.LG].