AIDAN SCANNELL

Machine Learning Researcher

www.aidanscannell.com | scannell.aidan@gmail.com | Helsinki, Finland | aidanscannell
aidan-scannell-82522789/ | piA0zS4AAAAJ | UK Driving Licence

"Machine Learning 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

Research Associate with Prof. Amos Storkey & Prof. Peter Bell

University of Edinburgh

Jan 2025 – Ongoing | Edinburgh, UK

- Sitting in the Bayesian and Neural Systems group with Prof. Amos Storkey & Prof. Peter Bell.
- Project: "Multimodal Reinforcement Learning (RL), LLMs and World Models".
- Investigating how to leverage "common sense knowledge" from LLMs/VLMs in multimodal RL and world models.

Reinforcement learning | Multimodal learning | World models | LLMs | Deep learning

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

Aalto University | Finnish Center for Artificial Intelligence (FCAI)

July 2022 – December 2024 | Helsinki, Finland

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

- Led a collaboration with 1 external and 2 internal PIs, and 3 PhD students, to develop a world model for use with both decision-time planning and background planning. Published findings at a top-tier ML conference (ICLR 2025).
- 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 2024).
- 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 | World models | Deep learning | Robotics

Co-lecturer @ Aalto University

Sept 2022 – December 2024 | Helsinki, Finland

- Co-lecturer on *(i)* Reinforcement Learning course and *(ii)* advanced course on Gaussian processes.
- 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

- Discrete Codebook World Models, Huawei-University of Edinburgh Joint Lab Workshop 2025, 2nd April 2025, Xi'an, China
- Sample-Efficient RL with Implicitly Quantized Representations, Nordic AI Meet + AI Day 2024, 20th Oct 2024, Helsinki, Finland
- iQRL - Implicitly Quantized Representations for Sample-efficient RL, International Workshop of Intelligent Autonomous Learning Systems, 23 July 2024, Darmstädter Haus, Austria
- 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 BNNs, 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 RL 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

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
@ Aalto University
arno.solin@aalto.fi

Prof. Joni Pajarinen
@ Aalto University
joni.pajarinen@aalto.fi

Prof. Carl Henrik Ek
@ University of Cambridge
che29@cam.ac.uk

Prof. Arthur Richards
@ University of Bristol
arthur.richards@bristol.ac.uk

REVIEWING

- Area chair for European Workshop on Reinforcement Learning (EWRL)
- 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)

AWARDS

- Awarded Postdoctoral Networking Tour in Artificial Intelligence (Postdoc-NeT-AI) fellowship by the German Academic Exchange Service (DAAD) for funded research visit to Germany.
- Awarded >300k GPU hours by LUMI Supercomputer for “”Sample-efficient Large-scale Reinforcement Learning”.
- Received four-year postdoctoral funding from Finnish Center of Artificial Intelligence to work on ’Model-based Reinforcement Learning under Uncertainty’.
- Awarded a four-year PhD scholarship at University of Bristol with the FARSCOPE Center for Doctoral Training.

PUBLICATIONS

Publications

- **Aidan Scannell**, Mohammadreza Nakhaei, Kalle Kujanpää, Yi Zhao, Kevin Luck, Arno Solin, and Joni Pajarinen (2025). Discrete Codebook World Models for Continuous Control. In: *The Thirteenth International Conference on Learning Representations*.
- Yi Zhao, **Aidan Scannell**, Yuxin Hou, Tianyu Cui, Le Chen, Arno Solin, Juho Kannala, and Joni Pajarinen (2025). Generalist World Model Pre-Training for Efficient Reinforcement Learning. In: *ICLR 2025 Workshop on World Models: Understanding, Modelling and Scaling*.
- Yi Zhao, **Aidan Scannell**, Wenshuai Zhao, Yuxin Hou, Tianyu Cui, Le Chen, Arno Solin, Juho Kannala, and Joni Pajarinen (2025). Efficient Reinforcement Learning by Guiding Generalist World Models with Non-Curated Data. In: *arXiv preprint arXiv:2502.19544*.
- Mohammadreza Nakhaei, **Aidan Scannell**, and Joni Pajarinen (2024a). Entropy Regularized Task Representation Learning for Offline Meta-Reinforcement Learning. In: *AAAI Conference on Artificial Intelligence (AAAI)*.
- – (June 2024b). 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 (2024a). iQRL - Implicitly Quantized Representations for Sample-efficient Reinforcement Learning. In: *arXiv preprint arXiv:2406.02696*.
- – (July 2024b). 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 (AISTATS)*.
- **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)*.