

Alexander Quessy

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Soon to graduate PhD student researching the use of unsupervised reinforcement learning for autonomous control in uncertain environments. Interested in the use of machine learning to model complex real-world systems and automate decision-making under uncertainty.

Education

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| PhD <i>Learning to Land: An Unsupervised approach towards Generalization in Reinforcement Learning</i> Aims to develop methods to learn generalizable policies through unsupervised learning. This was initially motivated by the problem of navigating fixed-wing aircraft to landing spots in GPS denied environments. | University of Bristol 2020-Present |
| MEng Aerospace Engineering First Class Honors | University of Bristol 2015-2019 |

Research Papers

- **Alexander Quessy**, Thomas S. Richardson, Sebastian East (2023) *Automating Fixed Wing Forced Landings with Offline Reinforcement Learning* IMAV2023
- **Alexander Quessy**, Thomas S. Richardson, Sebastian East (2023) *Safe Reinforcement Learning with Minimal Supervision* Preprint
- **Alexander Quessy**, Thomas S. Richardson, Mark Hansen (2022) *Vision based Semantic Runway Segmentation from Simulation with Deep Convolutional Neural Networks* AIAA Scitech 2022 Forum
- **Alexander Quessy**, Thomas S. Richardson (2022) *Quad2Plane: An Intermediate Training Procedure for Online Exploration in Aerial Robotics via Receding Horizon Control* Preprint
- **Alexander Quessy**, Thomas S. Richardson (2021) *Rewardless Open-Ended Learning (ROEL)* Preprint

Work Experience

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| University of Bristol <i>Postgraduate Teaching Assistant</i> Teaching assistant for various classes in Computer Science & Aerospace Engineering, notably: <ul style="list-style-type: none">◦ Machine Learning: Fundamental undergraduate course in machine learning, covering classical topics such as probabilistic inference, neural networks and PCA.◦ Data Science: Focused on the practical application of data science, the course covers key elements of the data-science pipeline, ranging from: data-wrangling and ingress to visualization and analysis. Students are assessed based on a coursework assignment where I supervise 2 group projects:<ul style="list-style-type: none">- UK Metal and Mining Corporate Earning Analysis: analyze the key components that drive the earnings of the largest mining companies listed on the FTSE 350 Metal and Mining index, based on economic & financial data collected from Bloomberg Terminal.- Tropical Cyclone Prediction: investigate the significance of data resolution on cyclone forecasting.◦ Aircraft Vehicle Design and System Integration: Graduate level course where I supervise a group of students in the design & development of a commercial jet transport aircraft working closely with Airbus's future design office.◦ Bristol mini-RL Conference: Organized a Reinforcement Learning conference with 3 other PhD students, this included: securing funding, inviting researchers to present and organizing a venue & schedule along with presenting my own research on Safe-RL. | Bristol, UK 2020-Present |
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| Aeros Flight Training <i>Flying Instructor</i> Instructed part-time during undergraduate term-time and full-time during holidays for a range of UK pilot licenses from ab-initio private licenses to commercial multi-engine instrument ratings. The role often required clear and concise communication with students, air traffic control, operations & engineering along with careful judgement and planning to ensure training was executed safely & concisely whilst complying with UK Civil Aviation Authority regulation. I continue to instruct freelance, mainly in aerobatics and multi-engine instrument training from London Biggin Hill Airport. | Gloucester Airport, UK 2017-2019 |
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Expertise

- Fluent in Python and MATLAB
- Experience building scalable software for High Performance Computing with GPU acceleration (CUDA) using containerization software (Docker) and shell scripting (Bash)
- Experience with machine learning frameworks (PyTorch & TensorFlow)
- Proficient in version control software (Git)
- Familiar with C, C++, and Rust