Alexander Quessy

104 Taybridge Road London – SW11 5PZ – United Kingdom

(+44) 07825 628 885 • aq15777@bristol.ac.uk

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

PhD **University of Bristol**

Thesis title: Learning Generalizable Policies through Unsupervised Reinforcement Learning *2020-Present*

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.

MEng Aerospace Engineering **University of Bristol**

First Class Honors *2015-2019*

Research Papers

- **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 (2021) *Rewardless Open-Ended Learning (ROEL)* Preprint
- **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, Sebastian East (2023) *Safe Reinforcement Learning with Minimal Supervision* Preprint
- **Alexander Quessy**, Thomas S. Richardson, Sebastian East (2023) *Automating Fixed Wing Forced Landings with Offline Reinforcement Learning* Under Review IMAV2023

Work Experience

University of Bristol **Bristol, UK**

Postgraduate Teaching Assistant *2020-Present*

Teaching assistant for various classes in Computer Science & Aerospace Engineering, notably:

- **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:
  - **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.

Aeros Flight Training **Gloucester Airport, UK**

Flying Instructor *2017-2019*

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.

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