Maximilian Bloor

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Education

Imperial College London, PhD in Chemical Engineering & Computer Science – London, UK — 2023 – Present

- **Working Title:** Reinforcement Learning for Process Control and Scheduling
- **Supervisors:** Dr. Antonio Del Rio Chanona & Dr. Calvin Tsay

Imperial College London, MSc in Advanced Chemical Engineering with Process Systems Engineering – London, UK — 2022 – 2023

- **Grade:** Distinction

University of Edinburgh, BEng (Hons) in Chemical Engineering – Edinburgh, UK — 2018 – 2022

- **Grade:** First Class Honours

Experience

Visiting Researcher, University of Alberta – Edmonton, Canada — June 2025 – Present

- Research stay hosted by Dr. Martha White in the Alberta Machine Intelligence Institute (AMii) and Reinforcement Learning and Artificial Intelligence (RLAI) groups
- Participant in AMii's AI Career Accelerator Program
- Working on model-based RL for demand response optimization

Process Engineering Intern, SLR Consulting Ltd – Edinburgh, UK — June 2022 – Sept 2022

- Worked within the Process Engineering team, focusing on renewable energy development (anaerobic digestion & energy from waste)
- Developed a bespoke model to assess UK feedstock competition for the client's portfolio, improving SLR's efficiency
- Collaborated with a multidisciplinary team to write and present technical due diligence reports
- Led a team of three interns to analyze and evaluate mass balance of a prospective anaerobic digestion plant, effectively communicating with project manager and director

Publications

Control-Informed Reinforcement Learning for Chemical Processes — 2025

Maximilian Bloor, Akhil Ahmed, Niki Kotecha, Mehmet Mercangöz, Calvin Tsay, Ehecatl Antonio del Río-Chanona

Industrial & Engineering Chemistry Research, 2025, 64, 49664978

Proposes a control-informed reinforcement learning framework that integrates PID control components into deep RL policy architectures. Demonstrates improved sample efficiency, set point tracking performance, and robustness to disturbances on a continuously stirred tank reactor system.

Gaussian Process Q-Learning for Finite-Horizon Markov Decision Process — 2025

Maximilian Bloor, Tom Savage, Calvin Tsay, Antonio del Río-Chanona, Max Mowbray

Under review for Reinforcement Learning Conference 2025

Develops a reinforcement learning framework combining Gaussian processes with Q-learning for finite-horizon MDPs. Introduces M-determinantal point processes for computational tractability and provides theoretical convergence guarantees. Evaluated on linear quadratic regulator and semi-batch reactor optimization problems.

Projects

PC-Gym: An Open-Source Library for RL Control of Industrial Processes 2024

- Developed pc-gym, an open-source Python library providing simulation environments for RL control of industrial processes.
- Implemented modular and extensible process models with the ability to apply constraints and disturbances
- Created utilities for integration with popular RL libraries, and tools for visualizing and benchmarking control policies against model-based control methods

Skills

Programming Languages: Python, MATLAB, VBA, GAMS, gPROMS

Machine Learning: PyTorch, JAX, HPC

Technology: Git, MS Office, LaTeX, Aspen Hysys