

# Maximilian Bloor

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## Education

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- Imperial College London**, PhD in Chemical Engineering & Computer Science 2023 – 2027 (Expected)
- **Research:** Reinforcement Learning for Sequential Decision Making and Stochastic Process Control.
  - **Technical Scope:** Deep RL, Bayesian Optimization, and High-Performance Computing (HPC).
- Imperial College London**, MSc in Advanced Chemical Engineering (Process Systems) 2022 – 2023
- **Grade:** Distinction (Focused on Mathematical Modeling and Numerical Optimization).
  - **Prize:** Achieved 2nd Place in the EURECHA process design competition. Presented the results at CAPE WP conference.
- University of Edinburgh**, BEng (Hons) in Chemical Engineering 2018 – 2022
- **Grade:** First Class Honours.

## Experience

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- Machine Learning Research Intern**, Secondmind – Cambridge, UK Oct 2025 - Jan 2026
- Developing **scalable batch Bayesian optimization** algorithms to accelerate high-dimensional design searches.
  - Applying **Gaussian Process** models to quantify uncertainty and improve decision-making efficiency.
  - Collaborating with a multidisciplinary team to implement research findings into a production-level stack.
- Visiting Researcher**, CrossnoKaye – Santa Barbara, USA September 2025
- Deployed **Offline RL** algorithms for industrial refrigeration control. Presented tutorials to senior stakeholders, translating RL theory into actionable business logic.
  - Received funding from a successful application to the Energy Demand Research Centre’s flexible fund.
- Visiting Researcher**, University of Alberta – Edmonton, Canada June – Aug 2025
- Conducted research on **model-based RL** for demand response at the Alberta Machine Intelligence Institute.
- Process Engineering Intern**, SLR Consulting Ltd – Edinburgh, UK June 2022 – Sept 2022
- Developed a **bespoke competitive analysis model** to assess market feedstock, improving operational efficiency.
  - Authored technical due diligence reports, communicating quantitative risks to project directors and clients.

## Select Publications

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- Gaussian Process Q-Learning for Finite-Horizon MDPs** (RLC 2025, Acceptance rate: 39%) 2025  
*Developed an RL framework combining Gaussian processes with Q-learning. Introduced M-determinantal point processes for computational tractability and provided **theoretical convergence guarantees**.*
- Control-Informed RL for Chemical Processes** (ACS I&ECR Special Issue ML in Chemical Eng.) 2025  
*Integrated PID control components into deep RL policy architectures, improving **sample efficiency and robustness** to external disturbances.*
- Published 4 journal papers and 4 conference papers in total. Full publication list can be found here.*

## Technical Projects

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- PC-Gym: Open-Source Library for RL and Stochastic Control** 2024
- Built a Python library for simulating complex environments with **enforced state/action constraints**.
  - Benchmarked RL policies against model-based control.

## Skills

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**Programming:** Python (PyTorch, JAX, NumPy, Pandas), MATLAB, GAMS, Git, HPC.

**Quantitative:** Reinforcement Learning (Offline/Online), Bayesian Optimization, Gaussian Processes, Stochastic Processes, Monte Carlo Simulation, Numerical Optimization, Time-Series Analysis.