Artificial Intelligence for Self-Driving Laboratories in Biotechnology

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This PhD project will develop artificial intelligence methods to enable self-driving laboratories for biotechnology and chemical engineering. The research will focus on AI tools that autonomously design, plan, and optimise experiments in high-throughput, automated facilities. The project will explore modern AI approaches such as large language model (LLM) agents for experimental reasoning, Bayesian optimisation across scales (including multi-fidelity and multi-objective optimisation), bi-level planning, and closed-loop process optimisation. These methods will be integrated with robotic and automated platforms to accelerate discovery and process development.

Applications will be tailored to the candidate's interests and may include biocatalyst optimisation, therapeutic protein production, microbial or mammalian strain development, and sustainable bioprocesses. The project offers training at the interface of AI, automation, and engineering biology. Applicants should have strong quantitative skills and an interest in programming (Python); prior experience in machine learning or biotechnology is advantageous but not essential.