

Research Proposal

Submitted by: Lu Thanh Thien

Project title: Adaptive Robotic Chemists for Resilient Pharmaceuticals

Supervisors: Dr Gabriella Pizzuto (Computer Science), Dr Anthony Bradley (Chemistry)

Centre: EPSRC CDT in Digital and Automated Materials Chemistry, University of Liverpool

Project Ranking

I chose this project as my top and only preference due to its integration of robotics, AI, and uncertainty modeling in pharmaceutical testing - an ideal match for my background and interests in intelligent systems, automation, and real-world scientific applications.

Alignment with My Background and Future Goals

This project represents a natural convergence of my academic and professional experience. I hold a First-Class Honors degree in Chemical Engineering, during which I conducted and published research on novel adsorbent materials for CO₂ capture using zeolite–chitosan composites. This work taught me the complexities of experimental design, material variability, and the importance of reproducibility in laboratory conditions.

After graduation, I pursued a self-directed transition into AI and robotics, spending six months building deep learning models and studying machine learning theory. I later worked as a Machine Learning Engineer, applying computer vision to industrial object detection tasks. Currently, I am an AI Compiler Engineer at BOS Semiconductor as a junior engineer, where I design and optimize inference pipelines for CNN models deployed on RISC-V NPU - skills that are highly relevant to robotic control, sensor processing, and edge computing in automated labs.

What particularly excites me about this project is its dual focus on physical lab automation and decision-aware autonomy. The opportunity to work with researchers across both Computer Science and Chemistry, and with industrial partners such as Bristol Myers Squibb, offers the collaborative, interdisciplinary setting I've been seeking. I see this PhD not just as a research opportunity, but as a launchpad for a career focused on building intelligent robotic systems for scientific discovery.

Fit with CDT Themes and Objectives

This project exemplifies the core mission of the CDT in Digital and Automated Materials Chemistry - bridging the gap between computational intelligence and experimental science. I am confident that my experience in chemical experimentation, deep learning, compiler optimization, and cross-domain project work has prepared me to contribute meaningfully to this ambitious initiative.