Ryan Reese

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Education

Imperial College London Oct 2024 — Sep 2025
Master's of Science, Digital Chemistry with AI and Automation *London, UK*
- Grade: 100% Distinction | Thesis: *"Computational Foundations to Assess Chemical Recyclability"* **(published)**
- Relevant Coursework: Machine Learning, Artificial Intelligence, Data Analytics | CFA Candidate (Aug 2025)

University of Hong Kong Sep 2020 — Aug 2024
Bachelor's of Science, Chemistry w/ Minors in Mathematics and Computer Science *Hong Kong*
- Dean's Honours List, CI Stapleton Merit Scholarship, Stanley Chu & Annie Chow Merit Scholarship
- Relevant Coursework: Machine Learning, Game Theory, Data Structures & Algorithms, Linear Algebra, Numerical Analysis, Differential Equations, Object-Oriented Programming, Discrete Mathematics, Multivariable Calculus

Technical Skills

- **Programming Languages**: Python, Rust, C/C++, Java, JavaScript, Bash, SQL, LaTeX, Typst
- **Technologies**: Linux (Arch, Debian), HPC, PyTorch, scikit-learn, pandas, NumPy, XGBoost, Git/GitHub, Jupyter, Docker, MongoDB, PostgreSQL, FastAPI, Node.js, Hugging Face, Weights & Biases

Quantitative Research

MSc Thesis Project | github1 | github2 Apr 2025 — Sep 2025
Computational Foundations to Assess Chemical Recyclability w/ Prof. Alex Ganose & Prof. Charles Romain
- Built an HPC-accelerated pipeline to compute monomer properties for feeding into multi-fidelity PyTorch models
- Optimised molecular design choices and quantified uncertainty in thermodynamic properties across parameter spaces
- Architected and deployed a production-grade RESTful API and cloud database (Pydantic/FastAPI/MongoDB) that reduced polymer dataset query latency and enabled real-time, validated data access for collaborative research

AI Research Intern May 2025 — Aug 2025
NLP-Driven Biomedical Knowledge Graph @ AI and Life Sciences Institute, Hong Kong
- Implemented an NLP-driven biomedical knowledge graph (spaCy/NLTK) to uncover novel drug–disease relationships,
- Developed an ETL pipeline to clean, normalise, and extract entities/relations from 100k+ PubMed and clinical trial records, enabling rapid and reproducible downstream analysis

Overseas Research Fellowship | github Jun 2023 — Aug 2023
Automating Visualisation of Markov Communities w/ Prof. Sophia Yaliraki & Prof. Mauricio Barahona
- Initiated, developed, and published PyPI Python package to automate biomolecular data visualisation, reducing processing time by >75% and enabling workflow reproducibility; Proactively secured HKD$10k research grant

Projects

Data Analytics Project | github Nov 2024 — Jan 2025
Benchmarking Machine Learning Models for Material Property Prediction
- Iteratively refined Graph Neural Networks (MACE, M3GNet) and GBRT (XGBoost) models to predict material properties; implemented novel molecular descriptors to reach SOTA accuracy from noisy, high-dimensional datasets
- Visualised latent trends in carbon allotropes and oxides using dimensionality reduction (UMAP, t-SNE)

Publications & Conference Presentations

Reese, Ganose & Romain. Thermodynamics of Ring-Opening Polymerisation Informatics Collection (TROPIC): A database to enable polymer chemical recycling. *Faraday Discussions* (2025)

"The 2nd Century Faraday Discussion, Oxford, UK, September 2025. **(selected poster, awarded conference grant)**
"Research Colloquium of Undergraduate Research, University of Hong Kong, October 2023. **(awarded best presenter)**
"Research Colloquium of Undergraduate Research, University of Hong Kong, October 2021. **(awarded best presenter)**

Extracurriculars

- **Interests**: audiophile equipment, mechanical keyboards, fountain pens, Vim/Neovim
- **Other**: National-Level SpeedCuber (former top 0.05% global), Associate Member of Royal Society of Chemistry