

QUENTIN TROLLET

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Education

MEng Material Science and Engineering – Imperial College London, UK

Sep 2021 - June 2025

Relevant modules: Mathematics and Computing [82%], Biomaterials [84%], Optoelectronic Materials [87%], Theory and Simulation of Materials [80%], Modelling Materials with DFT [85%]

First Class Honours: 75.82%
Dean's List 4th Year: 78.85%

Deep Learning Specialization – Coursera Online Course by Andrew Ng

Aug 2023 - Sep. 2023

CNNs, neural network architecture, PyTorch, basics of deep learning

International Baccalaureate (IB) Diploma – International School of Geneva, CH

Sep 2017 - May. 2021

Graduated with Merit and Distinction – Physics (7), Chemistry (7), and Math (7) at Higher Level

IB Score: 43/45

Research Experience

Synthetic Biology Research Placement (UROP) – Imperial College London, UK

Jun 2025 - Oct 2025

- Conducted laboratory research in José Jiménez's Synthetic Biology lab, supported by £10,000 FoNS-MAD funding, developing a two-stage bioprocess coupling enzymatic degradation of kelp biomass with microbial fermentation for pigment production.
- Cloned and expressed candidate laminarinases in E. coli BL21 using Gibson assembly, verified constructs by agarose gel electrophoresis, and produced enzyme cocktails through induced expression, cell lysis, and mixing to liberate fermentable sugars quantified by glucose colorimetric assays (GOPOD).
- Demonstrated pigment biosynthesis from kelp-derived substrates by culturing engineered E. coli strains producing Indigoidine and Violacein, confirming growth on released sugars and quantifying violacein yields via solvent extraction and spectrophotometric analysis.

Monte Carlo Guided Enzyme Design (MEng Thesis) – Imperial College London, UK

Oct 2024 - Jun 2025

- Conducted my MEng thesis in Stefano Angioletti-Uberti's Computational Biology Lab, collaborating with YC-backed startup AminoAnalytica.
- Built a modular Python pipeline for enzyme mutation and variant analysis, integrating the ESM-2 (3B) model via PyTorch; used DataLoader for batched inference, CUDA device management for GPU memory control, and deployed workloads on Imperial's HPC cluster with optimised GPU/CPU scheduling.
- Leveraged the learnt representation of proteomic language model ESM-2 to capture the effect of sequence mutations on the structure and geometry of the active site.
- Defined an energy function from cosine similarity between wild-type and mutant embeddings to guide a Monte Carlo exploration of sequence space, enabling sampling of thermodynamically favourable mutations.
- Analysed and visualised variants using Biopython/Biotite + PyMOL, applying IDDT, RMSD, TM-score to assess active-site geometry and structural conservation; used MD/MM simulations in explicit solvent to verify overall fold stability.

Research & Development Intern – Cyanoskin, UK

Sep 2024 - Jan 2025

- Interned at an award-winning carbon capture startup recognized for its work in sustainability and innovation.
- Advanced development of algae-based carbon-capturing coating by iterating new formulations through lab experiments and literature-driven research, improving stability and performance.
- Developed and tested bioflocculation & harvesting methods of cyanobacteria and microalgae to increase biomass yield and streamline downstream processing.
- Built a Python + OpenCV image-analysis workflow to quantify biomass growth directly from coating images, with automated result upload to the company database via Google APIs (bash + Python).
- Participated in meetings with CEOs from other carbon capture startups to integrate external insights into our R&D strategy.

Engineering & Leadership Experiences

Co-Founder & Lead Developer – EduNova, UK <https://www.edu-nova.co.uk>

Sep 2023 - Present

- Bootstrapped an education startup connecting London undergraduates with high school students for admissions tutoring.
- Reached £2,000 in revenue, hiring 20 tutors, managing contracts and payroll, and building operational processes.
- Designed and deployed full technical infrastructure: a dynamic, responsive website (HTML, CSS, JavaScript, WordPress), a serverless backend (Google Cloud Functions) automating data sync from Google Sheets to a cloud database, integrated Google Cloud Storage for tutor data and filters, and a Node.js API to process and serve structured tutor profiles for optimized search and display.

Covid 19 Epidemic Simulation – Imperial College London, UK

Mar 2022 - Apr 2022

- In a team of 4, built a Python-based agent simulation modelling virus transmission, mortality, and intervention effects; grade: 88%.
- Designed and tested scenarios, lockdowns, social distancing, vaccination, to analyse their impact on infection and mortality curves.
- Gained experience in systems modelling, stochastic simulations, and data analysis, applying Python libraries for computation and visualization.

Bending Test Machine – Imperial College London, UK

Oct 2021 - Jan 2021

- Led a 13-member simulated company in the design and construction of a bending test machine intended for schools; grade: 77%.

- Oversaw project management by organizing weekly meetings, ensuring active communication and participation, and keeping the team on track to meet deadlines, leveraging leadership and communication skills essential to our success.
- Applied engineering design skills using AutoCAD, 3D printing, and laser cutting to prototype components, gaining practical experience in manufacturability and testing.

Projects

Self-Hosted Full-Stack Web Infrastructure – quentintrolliet.com

Sep 2025 - Present

- Built and maintain a self-hosted Linux server running multiple containerised services (music, media, cloud) using Docker Compose, managing environment variables, persistent volumes, and inter-service networking.
- Developed and deployed full-stack web applications using Next.js, including an interactive molecular structure viewer and an application tracking dashboard.
- Implemented authentication, user management, and relational data storage using Supabase, integrating SQL-based schemas and queries into Next.js and Node.js applications.
- Built automated deployment workflows (webhooks → git pull → container rebuild) to enable continuous, low-downtime updates from GitHub.
- Configured secure public access via Cloudflare Tunnel and reverse proxying, overcoming CGNAT constraints without exposing local ports.

Publications

Adam Wu, **Quentin Trolliet**, Abhinav Rajendran, Jakub Lála, Stefano Angioletti-Uberti. *Mind the Gap: An Embedding Guide to Safely Travel in Sequence Space* - bioRxiv preprint 2025.06.19.660524; doi: <https://doi.org/10.1101/2025.06.19.660524>

Skills

- **Computer Languages:** Python (NumPy, Pandas, PyTorch, Biotite), JavaScript (Node.js), Bash, SQL, HTML/CSS
- **Platforms & Environments:** Linux, HPC (PBS job scheduling, GPU computing, CUDA), Google Cloud (storage buckets, IAM/service accounts, Cloud Functions / Cloud Run), Cloudflare (Tunnels), Docker & Docker Compose
- **Computational Biology & Protein Design:** Benchling, Boltz-1, AlphaFold, Colabfold, ESM-2/ESMFold, RFdiffusion, ProteinMPNN, Rosetta, PyMOL
- **Modelling & Simulation:** Monte Carlo Sampling, Molecular Dynamics (openMM), Finite Element Analysis (COMSOL), DFT (Quantum ESPRESSO)
- **Wet Lab:** Bacterial culture, primer design, transformation, Gibson assembly, agarose gel electrophoresis, microbial fermentation, growth and glucose assays, pigment extraction and spectrophotometric quantification
- **Software Engineering & Deployment:** Next.js, WordPress, Node.js, Supabase (authentication, SQL databases), Git/GitHub
- **Software & Tools:** Microsoft Office, LaTeX, AutoCAD
- **Spoken Languages:** French (native), English (native), Spanish (B2), German (B2)

Interests

Football (7 aside team), Tennis, Squash, Yoga, Home Server enthusiast, Reading