

Timing Liu (Tim)

Full-Stack Clinician: Computational Biologist · Software & AI Engineer · Doctor

London SW10, UK timingliu.dev@gmail.com timingliu.org

EDUCATION

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| University of Cambridge · MB BChir, Medicine | 2025 |
| DataCamp · Professional Data Scientist Certification | 2023 |
| University of Cambridge · MA (Hons), Engineering · information & bioengineering | 2022 |
| National Junior College , Singapore · GCE A-Level, full scholarship | 2018 |

SOFTWARE ENGINEERING EXPERIENCE

Finomics · Co-Founder Since 2025

Started a company to fix NHS rostering and pay. Hospitals save on locum costs through better-optimised staffing. Doctors get leave on their preferred dates without painful swaps. Rota managers get compliant, cloud-based software instead of messy spreadsheets. Access at [cloud.finomics.app](#) (test account on request).

Tech: React, TypeScript, Python, Postgres, a custom ML scheduler, cloud CI/CD.

Impact: piloting at two hospitals, and it saves about £7,500 per clinician a year.

Mansfield Advisors · Technical Consultant Since 2020

I write the data pipelines behind commercial due diligence in healthcare, vet and pharma: scraping, pulling signal out of messy text, and modelling.

Tech: Python, MongoDB, R, web scraping, NLP, modelling.

Impact: turned scattered market data into evidence behind real investment calls, across vet chains in the UK, China, Germany and Spain, and UK hospital groups.

University of Cambridge · End of Year Project, Reinforcement Learning 2022

I modelled the cart-pole system from simulator data, then wrote a controller that learns to balance the pole and keeps working when the readings and the dynamics get noisy.

Tech: Python, reinforcement learning, linear and kernel regression.

Impact: won the department's Project Prize as the top project in the year.

ClinicianWiki · Founder, Full-Stack Developer 2020 to 2021

A verified medical wiki, free for patients to read, that rewards doctors for sharing what they know in the open instead of locking it away in proprietary publishing.

Tech: Apache, MySQL, PHP, Azure DevOps, Linux, customised MediaWiki.

Impact: a charity of 10 staff, and an NHS Clinical Entrepreneur place in 2021.

Arete MedTech · Software Engineer 2020

I built a phone app for tracking COPD and asthma, working with the designer and the hardware team.

Tech: Xamarin, Flutter, iOS, Android.

Impact: shipped a working app and got a return offer.

Cambridge Clinical Trial Unit · Full-Stack Mobile Developer 2020

For three COVID-19 trials, I wrote the phone apps and helped with their reporting.

Tech: Xamarin, iOS, Android.

Impact: three live trials had their data-capture apps in the first wave.

Stop the Spread · Front-End Developer 2020

Early in the pandemic, I helped build sites that gave the public clear COVID information.

Tech: TypeScript, analytics, Slack automation.

Impact: helped the public get the latest information.

PERSONAL PROJECTS

- **Sync social.timingliu.org.** Reads a friend group's calendars, works out when everyone is *actually* free, and books the venue. Live, with feedback coming in. *Next.js 15, React 19, NextAuth, Prisma, Postgres.*
- **Cook.** A phone app tells you what you can cook tonight from what's in the cupboard, across 500+ recipes, with an LLM sous-chef to ask. *React, Vite, Supabase, Anthropic SDK, Capacitor.*
- **agent-todo.** A todo app built for AI agents as much as for people. They find, claim and finish tasks over REST, MCP or the CLI. *Node, TypeScript, better-sqlite3, MCP server.*
- **wardsim.** A ward-round trainer that invents patients, runs a clock with interruptions, and marks your free-text reasoning. *Python, with Claude driving it.*
- **Which LLM Are You? agenttest.timingliu.org.** A retro 12-question quiz that matches you to one of 16 LLM "souls." *Node, Express, web UI.*

I led and built the big model work across genomics, ophthalmology and clinical risk. That covers the *Pleiades* epigenetic foundation models (90M to 7B parameters, trained on 1.9 trillion tokens of methylation data), multimodal models that bring together genetics, health records and retinal images, and causal risk models over patient time-series.

Tech: PyTorch, transformers, foundation models, multimodal and causal modelling, GPU and HPC.

Impact: work towards blood tests that catch Alzheimer's and Parkinson's early (*bioRxiv* 2025), a retinal foundation model (*Nature* 2023), oculomics in schizophrenia (*JAMA Psychiatry* 2023), OCT analysis in AMD (*Ophthalmology Science* 2024), and causal models for donor-organ allocation and cystic fibrosis.

BIOINFORMATICS *Wellcome Sanger Institute · National University of Singapore*

I built statistical-genetics and diagnostics pipelines on HPC. At Sanger that meant genome-wide association and polygenic-risk work on a cohort of about 44,000 British South Asians, plus a 5'UTR analysis for Deciphering Developmental Disorders. At NUS I built embryo genetic-testing pipelines on Nanopore and Illumina, including an R package that spots aneuploidy down to 5 megabases with a Shiny front end, and a Fragile X assay.

Tech: Python, R, HPC pipelines, GWAS and PRS, Nanopore and Illumina, R and Shiny.

Impact: showed how often type 1 diabetes is missed in British Pakistanis and Bangladeshis (*Scientific Reports* 2025), published single-molecule PGT-A sequencing (*Clinical Chemistry* 2022) and a Fragile X/XE PCR method (*J Mol Diagn* 2021), and released the open-source CHRAB tool.

MEDICAL EXPERIENCE

Chelsea & Westminster Hospital · Resident Doctor

Since 2025

After three years of work and six years of medical school, I am finally trusted with acutely unwell patients across geriatrics, the acute medical unit and ED, including nights and weekends.

COMPUTATIONAL SKILLS

Tech: Python, R, SQL, C#, MATLAB, Shell, Xamarin, Flutter, TypeScript and JavaScript (React, Next.js), Go, Ruby, PHP, Cloud and GitHub CI/CD

Focus: deep learning and foundation models, multimodal and ophthalmic AI, statistical genetics and bioinformatics, full-stack web and mobile, data acquisition and management, agentic AI (MCP, LLM tooling).

SELECTED PUBLICATIONS *3 patents · 27 publications · >1450 citations · * equal contribution*

- Niki P, ..., **Liu T**, ..., Solanki R. Human whole-epigenome modelling for clinical applications with Pleiades. *bioRxiv* 2025.
- Zhou Y, ..., **Liu T**, ..., Keane P. A foundation model for diverse and generalisable disease detection from retinal images. *Nature* 2023.
- Wagner S, ..., **Liu T**, ..., Keane P. Multimodal retinal oculomics in schizophrenia: the AlzEye study. *JAMA Psychiatry* 2023.
- Moraes G, Struyven R, Wagner S, **Liu T**, ..., Keane P. Quantifying OCT changes in neovascular AMD under treatment. *Ophthalmology Science* 2024.
- **Liu T***, Lee C*, Floto A, van der Schaar M. Understanding longitudinal cystic-fibrosis progression using deep learning. *Under review*.
- **Liu T***, Paterson G*, ..., Finer S. Investigating misclassification of type 1 diabetes in British Pakistanis and Bangladeshis using polygenic risk scores. *Scientific Reports* 2025.
- Tan V*, **Liu T***, Arifin Z*, ..., Chong SS. Third-generation single-molecule sequencing for PGT-A and segmental imbalances. *Clinical Chemistry* 2022.
- **Liu T**, Wang FS, ..., Chong SS. Simultaneous FRAXA/FRAXE screening by triplet-primed PCR. *J Mol Diagn* 2021.

AWARDS & APPOINTMENTS

Fitzwilliam Chinese Scholarship, 2022 to 2025.

Project Prize for the top reinforcement-learning project, Cambridge University Engineering Department, 2022.

Engineers' Progress Prize, Fitzwilliam College, 2022.

ARVO travel grant and press release, 2022 to 2023.

NHS Clinical Entrepreneur, 2021.

Winner, MIT COVID-19 Challenge, 2020.

Valedictorian, Science Research Programme, National University of Singapore, 2018.

Open source: lead developer of CHRAB; contributor to RETFound, AutoMorph, targets, KING.

Editorial: Review Editor, *Frontiers in Digital Health*; peer reviewer for Wellcome Open Research, *Ophthalmology Science*, *BMC Genetics*.

Member: ARVO, Cambridge University Algorithmic Trading Society, Associate Member of the American College of Physicians.

Languages: native English and Mandarin, professional Cantonese, elementary Turkish, Korean and French.