Daniel English-Brown

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Summary

Highly motivated and conscientious MSc Theoretical Physics student at King's College London with a strong background in computational physics, quantitative research, and STEM education. Demonstrated excellence across academic, athletic, and extracurricular domains with particular expertise in numerical methods, electromagnetic simulation, advanced mathematics, web-development and cross-cultural communication. Seeking opportunities in quantitative research or PhD programmes in theoretical physics.

Work Experience

Lead Web Developer at Expendid **September 2025–Present**

- Led the end-to-end development of Expendid's web platform, an AI-powered finance management tool for freelancers.
- Designed and implemented a multi-page marketing site, including landing, referral leaderboard, waitlist, legal, and contact pages.
- Engineered responsive, mobile-first UI/UX with custom animations, dark/light mode theming, and modern design systems.
- Built backend functionality with Flask, integrating email automation, contact forms, and admin authentication.
- Established project structure, version control practices, and deployment-ready architecture to support future scalability.
- Collaborated closely with the product team to align design, functionality, and branding strategy.

STEM Outreach Ambassador **September 2024–Present**

- Presented the Natural, Mathematical and Engineering Sciences (NMES) faculty at King's College London to prospective students, parents, and school groups.
- Demonstrated complex STEM principles and experiments using engaging, pedagogical approaches to diverse audiences.
- Developed and delivered compelling presentations to promote the university's physics programme, enhancing student recruitment.
- Fostered an approachable and informative environment for clients, effectively communicating the value of a STEM education.
- Collaborated with faculty and team members to ensure a consistent and positive experience for all visitors.

Private Tutor, Mathematics, Physics, and English **January 2024—Present**

- Delivered customised one-on-one instruction, developing individualised learning plans tailored to each student's specific academic goals and learning style.
- Designed and implemented supplementary educational materials and exercises that extended beyond standard curricula to deepen conceptual understanding.
- Facilitated significant academic improvement for students, as measured by elevated school grades and enhanced subject proficiency.
- Employed adaptive teaching methodologies to explain complex scientific and mathematical concepts in an accessible manner.

Student Ambassador, King's College London **September 2023–Present**

- Served as an official representative of the university, engaging with prospective students and parents to promote King's College London's academic programmes and student experience.
- Conducted informative campus tours, showcasing university facilities and articulating the institution's history and heritage to diverse audiences.
- Cultivatede positive relationships with visitors through professional communication and personalised guidance throughout the admissions process.
- Acted as a liaison between the university and prospective students, effectively communicating the value proposition of a KCL education.

Team Mentor, Girls' Robotics Challenge **November 2024–April 2025**

- Led and mentored a team of eight students in the UK's inaugural all-girls national robotics competition, fostering skills in STEM and teamwork.
- Guided the team through the full product development lifecycle, from initial design to building and programming a functional robot using the BBC micro:bit platform.
- Managed project timelines and team coordination to successfully meet all competition milestones and deadlines.
- Simplified complex engineering and programming concepts into digestible lessons for a novice audience, enhancing their technical understanding.
- Facilitated creative problem-solving sessions to troubleshoot technical and conceptual challenges throughout the design process.

Quantitative Research Intern at Perbak Capital Partners, London **September 2024**

- Developed and implemented quantitative models, including Black-Scholes and binomial option pricing models, to assess derivative security valuation and inform trading strategies.
- Engineered Python algorithms to analyze non-normal stock return distributions, model price movements, and quantify market volatility for risk assessment.
- Constructed and optimised market-neutral portfolios using convex optimisation techniques (CVXPY) to maximise returns for a given risk profile.
- Performed rigorous fundamental analysis on private companies.
- Utilised statistical methods to clean, smooth, and prepare financial time-series data for use in quantitative research.
- Surveyed and analyzed futures contracts to identify arbitrage opportunities and assess their impact on portfolio risk.

Projects

Personal Portfolio Website

Designed and developed a responsive, interactive portfolio website showcasing my technical skills, projects, and professional experience. The single-page application features a modern dark/light theme toggle, animated physics equations background, testimonial carousel, and mobile-optimized design.
Built with pure HTML5, CSS3, and JavaScript, the site demonstrates expertise in front-end development including responsive design principles, CSS animations, DOM manipulation, and cross-browser compatibility. The portfolio highlights my unique combination of theoretical physics knowledge and practical web development skills.
Technologies: HTML5, CSS3, JavaScript, Responsive Design, UI/UX Design
Completed: *September 2025*
www.danielenglish.me

Building a Finite Difference Time Domain (FDTD) Electromagnetic Simulation Software *Grade: First Class*

Supervised by Dr. Francisco Rodríguez-Fortuño, I developed a custom 2D Finite-Difference Time-Domain (FDTD) electromagnetic simulator in Python to model and analyse dielectric ring resonators.
The project involved implementing the Yee lattice algorithm to solve Maxwell's equations, designing Gaussian-tapered absorbing boundary conditions to minimise simulation artifacts, and executing a parameter sweep to investigate the relationship between resonator radius and key optical properties.
My analysis successfully characterised resonant modes, the Free Spectral Range (FSR), and quality (Q) factors, with results validating theoretical predictions. The work, which required advanced numerical analysis and large-scale data visualisation, culminated in a First-Class grade.
Completed: *April 2025*
Project Summary and Code

Desk-Research Project: Effects and Implications of Pollution on Zimbabwean Ecosystems and Population

Conducted an independent desk-research project investigating the severe impact of industrial and mining pollution on Zimbabwe's ecosystems and population health. The research synthesised data from academic journals, NGO reports, and national statistics to analyze case studies such as the 2008 cholera epidemic and water contamination in the Gwanda district. It culminated in a critical evaluation of the government's environmental policies and proposed practical solutions focused on sustainable mining practices, investment in renewable energy, and public health initiatives tailored to a developing economy.

Completed: *April 2020*

Link to Project

Education

2025–2026 **MSc** Theoretical Physics at **King's College London**

2022–2025 **BSc (Hons)** Theoretical Physics at **King's College London**
Admitted with unconditional offer, reserved for exceptional candidates

2020–2022 **A-level** Physics, Chemistry, Maths and French at **Ampleforth College** (AABB)
Awarded Academic Scholarship for outstanding academic achievement

Test Results

SAT Exam

Score: **1510/1600 — 99th percentile**
Evidence-Based Reading & Writing: ***770***
Maths: ***740***
Test Date: **December 2021**

Hanyu Shuiping Kaoshi (HSK) Level 4 — 汉语水平考试四级

Score: 226/300
Test Date: **November 2022**

Hanyu Shuiping Kaoshi (HSK) Level 5 — 汉语水平考试五级

Score: 179/300
Test Date: **June 2025**

Language Skills

English Native — Level C2

Chinese Full Professional Fluency — Level C1

French Professional Fluency — Level B2

Skills

Programming languages	Python (NumPy, SciPy, Pandas, Matplotlib, PyGame, Tkinter), MATLAB, JavaScript, HTML/CSS
Quantitative finance	Financial Modeling, Options Pricing (Black-Scholes, Binomial), Portfolio Optimization, Risk Analysis, Risk Neutral Valuation
Computational physics	Finite Difference Methods, Electromagnetic Simulation, Numerical Analysis, Data Visualization
Mathematics	Advanced Calculus, Linear Algebra, Differential Equations, Complex Analysis
Software & Tools	LaTeX, Git, Microsoft Office Suite, Adobe Creative Suite
Laboratory skills	Experimental Design, Data Acquisition, Statistical Analysis, Technical Reporting
Soft skills	Leadership, Cross-cultural Communication, Team Mentorship, Public Speaking, Adaptive Teaching